13 - 97

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1884.

No. 132.

JOHN S. ROWELL AND IRA ROWELL, APPELLANTS,

vs.

EDMUND J. LINDSAY AND WILLIAM LINDSAY.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF WISCONSIN.

FILED OCTOBER 18, 1881.

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INDEX.

	Original.	Print.
Caption	1	1
Bill of complaint	2	1
Subpœna	10	8
Marshal's return	11	9
Answer	12	9
Supplemental answer	14	11
Replication	16	12
Order setting cause for hearing	17	12
Order as to testimony	17	13
Order setting cause for hearing	18	13
Hearing	19	13
Amended supplemental answer	20	14
Hearing concluded, &c.	20	14
Evidence for complainants	22	15
Letters-patent No. 2,909, reissue, granted John S. and Ira Rowell March 31, 1868	22	15
Testimony of John S. Rowell	24	17
Samuel Rowell	42	32
Melville E. Dayton	48	37
John S. Kowell (recalled)	60	49
G. L. Chapin	62	51
Evidence for defendants	89	76
Testimony of F. E. Saker	89	76
D. J. Woodard	93	79
G. D. Rowell	96	81

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	Original.	Print.
Testimony of M. C. Goucher	99	85
E. J. Lindsay	114	98
D. J. Powers	122	104
J. S. Bogle	179	156
A. R. Ludlow	205	180
Griffith Hinchman	224	198
Jazeb Hollingsworth	230	203
Carroll Atwood	234	207
Letters patent granted David Eberly, No. 18894, December 22, 1857	241	213
Levi Haversticke, No. 7241, April 2, 1850	249	215
Fowler & Bacon, No. 47008, March 28, 1865	258	219
C. Atwood, No. 54089, April 24, 1866	265	221
Henry Francisco, No. 46654, March 7, 1865	273	224
File wrapper, &c., of letters patent granted C. Atwood, No. 54089, April 24, 1866	282	227
Specifications, &c., of letters patent granted J. H. & J. W. Thomas, No 152706, June 30, 1874	298	231
Decree	299	233
Appeal prayed and allowed	299	233
Bond	300	233
Clerk's certificate	303	235
Citation	304	235

1 Circuit Court of the United States for the Eastern District of Wisconsin.

UNITED STATES OF AMERICA, *Eastern District of Wisconsin*, } ss:

At a stated term of the circuit court of the United States of America for the eastern district of Wisconsin, begun and held according to law, at the city of Milwaukee, in said district, on the first Monday, (being the third day) of January, A. D. 1881—present and presiding, the Honorable Charles E. Dyer, district judge, Henry Fink, marshal, Edward Kurtz, clerk—among other, the following proceedings were had, to wit:

JOHN S. ROWELL & IRA ROWELL, Complainants,
vs.
EDMUND J. LINDSAY & WILLIAM LINDSAY, Defendants. } In Equity.

Be it remembered that heretofore, to wit, on the 12th day of March, A. D. 1878, came the above-named complainants by their solicitors, Mr. James J. Dick, and filed their bill of complaint against the above-named defendants as follows, to wit:

2 *Bill of Complaint.*

United States Circuit Court, Eastern District of Wisconsin.

JOHN S. ROWELL and IRA ROWELL
vs.
EDMUND J. LINDSAY, and WILLIAM LINDSAY. } In Equity.

United States Circuit Court. In Equity. For the Eastern District of Wisconsin. In the Seventh Circuit.

To the honorable the judge of the circuit court of the United States, for the seventh circuit, within and for the eastern district of the State of Wisconsin:

John S. Rowell, of the city of Beaver Dam, State of Wisconsin, and a citizen of the State of Wisconsin, and Ira Rowell, of the city of Beaver Dam, State of Wisconsin, and a citizen of the State of Wisconsin, bring this their bill against Edmund J. Lindsay, of the city of Milwaukee, State of Wisconsin, and a citizen of the State of Wisconsin, and William Lindsay, of the city of Milwaukee, State of Wisconsin, and a citizen of the State of Wisconsin, in said district.

And thereupon your orators complain and say:

That John S. Rowell and Ira Rowell, who were then citizens of the United States, and the parties above named, were the true and original inventors of a "new and useful improvement in cultivators," which said improvement was not known or used by others before the invention and discovery thereof by said John S. Rowell and Ira Rowell, who thereupon did apply to the Commissioner of Patents of the United States of America for letters patent of and for said improvement, and fully and in all respects complied with all the requirements of law in that behalf, and made oath, among other

things, that they verily believed themselves to be the true inventors or discoverers of the said improvement, and that the same had not to their knowledge and belief been previously known or used, and that they were citizens of the United States, and also paid into the Treasury of the United States the sum of thirty dollars, and presented to the Commissioner of Patents of the United States a petition setting forth their desire to obtain an exclusive property
3 in said improvement, and praying that letters patent might for that purpose be granted unto them, and also delivered and filed in said office of Commissioner of Patents a written description of their said improvement in such clear, full and exact terms, as to enable any person skilled in the art with which the said improvement is most nearly connected to make and use the same, which said description was duly signed by the said John S. Rowell and Ira Rowell, and attested by two witnesses; and thereupon the said Commissioner of Patents caused letters patent to be made out and issued in the name of the United States of America in due form of law, in all respects, bearing date the third day of July, in the year one thousand eight hundred and sixty-six, whereby was granted unto the said John S. Rowell and Ira Rowell, their executors, administrators, or assigns, for the term of seventeen years from the date thereof, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used the said improvement, which is entitled in said letters patent "a new and useful improvement in cultivators," and the said letters patent having been duly signed by the Secretary of the Interior, and countersigned and sealed with the seal of the Patent Office, by the Commissioner of Patents of the United States, and having been duly recorded, were issued and delivered unto the said John S. Rowell and Ira Rowell.

Your orators further show that the said John S. Rowell and Ira Rowell, after the granting of said letters patent as aforesaid, and before the committing the grievances of and by the defendants hereinafter mentioned, surrendered the aforesaid letters patent to the Commissioner of Patents according to law, on account of a defective specification, the error having arisen by mistake, and without any fraudulent or deceptive intention, and a new letters patent was duly made out and issued to them by the said Commissioner of Patents, in the name of the United States of America, in due form of law, in all respects, bearing date the thirty-first day of March, one thousand eight hundred and sixty-eight, for the same invention in accordance with their corrected description and specification, whereby was granted and secured to the said John S. Rowell and Ira Rowell, and their heirs, executors, administrators, and assigns, for the full term of seventeen years from the said third day of July, one thousand eight hundred and sixty-six, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used the said improvement therein described and claimed, which is entitled "a new and useful improvement in cultivators," a description whereof is given in a schedule to said letters patent annexed and made part thereof, as in and by said reissued letters patent, and

No. 2909

J. S. and Ira Rowell

Cultivator

Fig. 1.

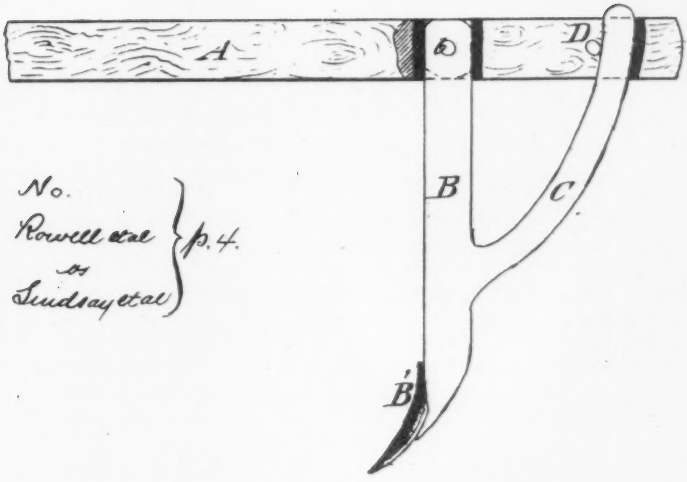

Fig. 2

said schedule thereto annexed, or a certified copy thereof to be produced, reference being hereby had, will more fully and at large appear, and the said letters patent having been duly signed by the Secretary of the Interior, and countersigned and sealed with the seal of the Patent Office, by the Commissioner of Patents of the
4 United States, and the same having been duly recorded, were duly issued and delivered unto the said John S. Rowell and Ira Rowell.

And your orators further show that in and by said schedule it was made known and declared that the invention consisted and was as follows:

"Be it known that we, John S. Rowell and Ira Rowell, of Beaver Dam, in the county of Dodge and State of Wisconsin, have invented a new and improved cultivator; and we do hereby declare the following to be a full, clear, and exact description of the same, sufficient to enable those skilled in the art to which our invention appertains to make use of it, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a side elevation of the tooth, in a beam shown in a longitudinal section.

Figure 2 is a top view of the beam, with the tooth in position.

This invention consists in applying to the shank of the tooth a curved brace-bar, the upper end of which passes through a slot or mortise in the beam, and is held in position by a clamping-bolt, which passes transversely through the slot or mortise near the brace-bar, and forces the sides of the beam together against the brace-bar, so as to clamp it in any required position, and thereby adjust the tooth in any inclination, at the same time allowing it to yield to immovable obstacles without breaking.

(Here follows diagram, marked p. 4.)

In the drawings A represents one of the beams of a cultivator; B, the shank; pivoted at *b;* B′, the tooth; C, a curved brace-bar, extending, in an arc of a circle, outward and upward from the rear side of the shank B, and its upper end passing vertically through a longitudinal slot or mortise, *a*, in the beam A; and D, a bolt, passing transversely through the slot or mortise, and having a head, *d*, on one end, and a nut, *d′*, on the other, by which the side walls of the slot or mortise can be clamped against the brace-bar with any required force, thereby holding the latter in position when operating in the field.

It is evident that, in a device thus constructed and operating, the brace-bar, C, can be so clamped that the tooth will retain its position when working in arable soil, but will yield when coming in contact with an immovable obstacle and pass over it without breaking, the shank turning back upon its pivot, *b*, and the brace-bar being forced up through the slot. The same arrangement also allows the shank to be adjusted in any position for deep or shallow cultivating.

The device above described may be cheaply applied, is of very

simple construction, and has been found more effective, practically, than other devices designed to operate in a similar way.

Having thus described our invention, what we claim as new and desire to secure by letters patent is:

The combination of the slotted beam A, shank B, brace-bar C, and bolt D, when the parts are constructed and arranged to operate as and for the purposes herein specified."

5 And your orators further show that the said John S. Rowell and Ira Rowell are in the full enjoyment of the rights and interests acquired by and granted to them as aforesaid, and have been from the time of making the said letters patent, and have always made, used, and vended to others to be used the said several improvements so patented as aforesaid, and have had and maintained the sole and exclusive possession of the said improvements and inventions under and by virtue of the said several letters patent, and have never acquiesced in any invasion or infringement of their said rights, and have had the sole and exclusive right and liberty to make, use, and to others to be used the said improvement, and by themselves, their agents, and servants did make, use, and vend to others to be used the said improvements, and that said rights and interests by virtue of said patents have been and are of great value to your orators. And that your orators are entitled to all the damages and profits occasioned by the infringement of said letters patent by the manufacture, sale, or use of seeders and cultivators and improvements on the same, made in violation of the said letters patent; are by law entitled to sue for and recover the same to their own use.

And your orators further show that they believe, and therefore charge the fact to be, that the said John S. Rowell and Ira Rowell were the original and first inventors and discoverers of the improvements and inventions named and set forth in said letters patent above mentioned and described, patented as aforesaid, and described and claimed in said letters patent as aforesaid, and that the same were not known or used by any other person before the invention and discovery thereof by said John S. Rowell and Ira Rowell as aforesaid; and that the same was not at the time of the said application for letters patent in public use or on sale with the consent, knowledge, or allowance of them, or either of them, and that the said John S. Rowell and Ira Rowell, herein mentioned, are the same and identical persons named in said letters patent above mentioned and described, and that at the several times of the granting of said letters patent, as herein mentioned, the said John S. Rowell and Ira Rowell were citizens of the United States.

And your orators further show that the defendants, Edmund J. Lindsay and William Lindsay, are and have been partners in business and engaged in business at the city of Milwaukee, in the eastern district of the State of Wisconsin, under the name and style of E. J. and Wm. Lindsay, and that the said Edmund J. Lindsay and William Lindsay in their business, by themselves, their agents and servants, contriving and wrongfully and injuriously intending to injure the said John S. Rowell and Ira Rowell, and to deprive them of the

profits and benefits and advantages which they might and otherwise would have derived and acquired from the making, using, and vending to others to be used of the said invention, did after the making of the said last-mentioned letters patent, to wit, the thirty-first day of March, 1868, and on various other days and times since that time and
6 the commencement of this action, in the State of Wisconsin, unlawfully and unjustly, and without the leave or license of the said John S. Rowell and Ira Rowell, and against the will of said John S. Rowell and Ira Rowell, use and vend to others to use and be used a large number of seeding machines, but how many your orators cannot state, but pray that the said Edmund J. Lindsay and William Lindsay may discover and set forth, each and all, to wit, the said machines, seeders, and cultivators, with the improvements thereon, with all of that part of the improvements to cultivators attached thereto, or embodied therein, which is mentioned in said letters patent, or the schedule appended thereto, and which has been heretofore particularly set forth, in imitation of said invention of said John S. Rowell and Ira Rowell, and in violation and breach of the said last-mentioned letters patent, and against the privileges so granted as aforesaid by said letters patent, whereby the said John S. Rowell and Ira Rowell have been and are greatly injured and deprived of a large amount of profits and advantages which they might and otherwise would have acquired and derived from the said invention; and that the said Edmund J. Lindsay and William Lindsay refuse to pay to your orators any of the profits made by such unlawful using and selling, or to desist from using and selling the same in violation and infringement of your orators' rights, secured to them as aforesaid; and your orators have reason to believe that said Edmund J. Lindsay and William Lindsay will continue to use and sell the same and refuse to pay your orators any of the profits which they have or shall make by such unlawful using and selling as aforesaid.

Your orators further show and allege, upon information and belief, that said Edmund J. Lindsay and William Lindsay have combined and confederated with each other and with other persons to your orators unknown, but whom, when discovered, your orators pray leave to make parties defendants hereto, to resist and destroy the exclusive rights and privileges secured to your orators as aforesaid by the letters patent hereto described, and use and vend the seeders and cultivators embracing the improvements and inventions described in said letters patent, and the schedule thereto annexed, to your orators as aforesaid, without the consent or allowance of your orators, and in violation of their rights and privileges.

All which actings and doings are contrary to equity and good conscience, and tend to the manifest injury of your orators in the premises, and that your orators will be subject to great and irreparable injury unless they shall obtain from your honors the relief hereby sought.

In consideration whereof, and for as much as your orators can only have adequate relief in this honorable court where matters and things of this kind are made cognizable by statute.

To the end, therefore, that the said defendants, Edmund J. Lindsay and William Lindsay, and each and every of them, may, if he or they can, show why your orators should not have the relief
7 prayed for, and may upon their corporal and respective oaths, and according to the best and utmost of their several and respective knowledge, remembrance, information, and belief, full, true, and direct and perfect answer make to all and singular the matters hereinbefore charged and stated, as fully and particularly as if the same were hereinafter repeated, and they severally thereunto distinctly interrogated, and more especially may upon their several and respective oaths and according to the best and utmost of their several and respective knowledge, remembrance, information, and belief, full, true, direct, and perfect answer make to such of the several interrogatories hereinafter numbered and set forth, that is to say:

1st. Whether they or any of them have not used or sold, or caused to be used or sold, seeders and cultivators embracing the improvements and inventions described in said letters patent hereinbefore mentioned and secured to your orators since the thirty-first day of March, A. D. 1868, and what number thereof according to the best of their several and respective knowledge, information and belief, as near as they can approximate thereto.

2d. Whether they or any of them have not used or sold, or caused to be used or sold, seeders and cultivators embracing the improvements and inventions described in said letters patent hereinbefore mentioned and so secured to your orators, and what number thereof, according to the best of their several and respective knowledge, information and belief, and the times and dates when so sold or used, or caused to be sold or used, as near as they severally can approximate the same.

3d. Whether they or any of them have not received money or property directly or indirectly from the use or sale since the thirty-first day of March, 1868, of seeders and cultivators embracing the improvements and inventions described in said letters patent hereinbefore mentioned and so secured to your orators, and what amount of such money or property they have severally and respectively received or are entitled to receive from such use or sale since the thirty-first day of March, A. D. 1868, specifying the amount received in each of the successive years respectively, according to the best of their several and respective knowledge, information and belief, as near as they severally can approximate the same.

4th. Whether they or any of them have not now on hand a number and how many of such seeders and cultivators embracing the improvements and inventions described in said letters patent, and so secured to your orators, and how many of such inventions.

5th. Whether the seeders and cultivators embracing the improvements and inventions described in said letters patent, and so secured to your orators, and used and sold by said defendants, or any of them, as aforesaid stated, were made by Thomas, Ludlow & Rogers, of Springfield, Ohio, and if not, by whom were they made.

And that the said defendants Edmund J. Lindsay and William

Lindsay, and each and every of them, may answer the premi-
8 ises and may be decreed to account for and pay over to your orators all such gains and profits which they have made, or which have accrued to them, or either of them, from their said infringement, by such unlawful use and sale of such seeders and cultivators, embracing the improvements and inventions described in said letters patent above mentioned, and so secured to your orators, and also to pay to your orators in addition to said profits the damages which have been sustained by your orators, by reason of said infringement.

And may it please your honors, the premises considered, to grant unto your orators, the writ of injunction issuing out of and under the seal of this honorable court, or issued by one of your honors, according to the form of the statute in such case made and provided, perpetually enjoining and restraining the said several defendants and each of them, and their and each of their clerks, attorneys, agents, servants, and workmen from directly or indirectly using or selling to others any seeder or cultivator embracing the improvements and inventions described in said letters patent above mentioned, and so secured to your orators.

And may it please your honors to grant to your orators a provisional or preliminary injunction issuing out of and under the seal of this honorable court, enjoining and restraining the defendants and each of them, and each of their attorneys, clerks, agents, servants, and workmen to the same purport, and tenor, and effect hereinbefore prayed for, in regard to said perpetual injunction, pending this cause.

And that your orators may have such further and other relief as the nature of the case may require, and to your honors may seem meet.

And may it please your honors to grant unto your orators a writ of subpœna of the United States of America, issuing out of and under the seal of this honorable court, directed to said defendants Edmund J. Lindsay and William Lindsay, and each of them, commanding them and each of them, on a day certain therein to be named, and under a certain penalty, to be and appear in this honorable court, then and there to answer all and singular the premises, and to stand to, perform, and abide such further order and decree, as may be made against them or either of them.

And your orators, as in duty bound, will ever pray, etc.

JOHN S. ROWELL.
IRA ROWELL.

JAMES J. DICK,
Solicitor and of Counsel for Complainants.

9 UNITED STATES OF AMERICA, }
Eastern District of Wisconsin, County of Dodge, } *ss:*

At the city of Beaver Dam, in the county of Dodge, State of Wisconsin, in the said eastern district of Wisconsin, on the eleventh day of March, A. D. 1878, personally appeared the above-named Ira

Rowell, who being first duly sworn according to law, deposes and saith for himself, and for and on behalf of said John S. Rowell, that he is one of the complainants above named in the foregoing bill, and has read the same, and knows the contents thereof.

That the said bill is true of his own knowledge, except as to those matters which are therein stated on information and belief of complainant, and as to those matters he believes it to be true.

That this deponent verily believes John S. Rowell and Ira Rowell, herein in said bill above named, to have been the first and original inventors of the improvements claimed in said letters patent named in said bill of complaint.

IRA ROWELL.

Subscribed and sworn to before me, this eleventh day of April, A. D. 1878.

[SEAL.]

J. E. HOSMER,
Notary Public, Dodge Co., Wis.

The defendants and each of them are required to answer the interrogatories in the foregoing bill of complaint, numbered respectively 1, 2, 3, 4, 5.

JAMES J. DICK,
Solicitor and of Counsel for Complainants.

Whereupon a subpœna issued, returnable the first Monday of May next, as follows:

10 UNITED STATES OF AMERICA, *Eastern District of Wisconsin:*

[SEAL.] The President of the United States of America to Edmund J. Lindsay and William Lindsay, Greeting:

You are hereby commanded that you personally appear before the judges of the circuit court of the United States of America for the eastern district of Wisconsin, in our court of chancery in and for the district aforesaid, on the first Monday of May next ensuing, at Milwaukee, to answer to a bill of complaint exhibited against you in our said court by John S. Rowell and Ira Rowell.

And to do further and receive what our said court shall have considered in that behalf; and this you are not to omit under the penalty which may ensue.

This process of subpœna is directed to the marshal of this district, who is hereby commanded to serve the same upon the said Edmund J. Lindsay and William Lindsay, if to be found in his district, and due return thereof make.

Witness the Honorable Morrison R. Waite, Chief Justice of the Supreme Court of the United States, at the city of Milwaukee, in the said district, this twelfth day of March, in the year of our Lord one thousand eight hundred and seventy-eight and of our Independence the 102nd.

EDWARD KURTZ, *Clerk,*
By J. M. MILLER, *Deputy Clerk.*

JAMES J. DICK,
Beaver Dam, Wis., Solicitor.

It is ordered by our said court that the said Edmund J. Lindsay and William Lindsay, the defendants aforesaid, do enter their appearance in this suit in the clerk's office, on or before the day and time at which this subpœna is returnable, as aforesaid; otherwise the bill filed may be taken as confessed.

11 Subpœna returned: "Served on the within-named Edmund J. Lindsay, at Milwaukee, by delivering to him personally a copy of this subpœna, this 20th day of March, A. D. 1878.

HENRY FINK, *Marshal*,
By W. A. NEWELL, *Deputy*.

Served on the within-named William Lindsay by delivering to him personally a copy of this subpœna, this 29th day of March, A. D. 1878.

Fees, $4 66. HENRY FINK, *Marshal*."

MAY 3, 1878.

This day came the defendants, by their solicitors, Messrs. Wood & Boyd, and filed their answer, as follows:

12 *Answer.*

Circuit Court of United States for Eastern District of Wisconsin.

JOHN S. ROWELL *et al.*
vs.
E. J. LINDSAY *et al.* } In Equity. Answer.

The joint and several answer of Edmund J. Lindsay and William Lindsay, defendants to the bill of complaint of John S. Rowell and Ira Rowell, complainants.

These defendants now and at all times hereafter saving to themselves all and all manner of benefit or advantage of exception or otherwise that can or may be had or taken to the many errors, uncertainties and imperfections in the said bill contained, for answer thereto or to so much thereof as these defendants are advised it is material or necessary for them to make answer to, severally answering, say:

That they are informed and believe and therefor admit that letters patent for an alleged improvement in cultivators were granted and issued to the said complainants July 3d, 1866, and that said patent was subsequently surrendered and new letters patent granted and issued to the complainants March 1st, 1868, but whether said surrender was made for good and lawful cause, or whether the requirements of the law were complied with these defendants are not advised save by said bill, and therefore leave complainants to make such proof of the facts as they may be advised, but these defendants deny that the complainants were the original and first inventors of the alleged improvements.

These defendants further admit that between said first day of March, 1868, and the filing of the bill herein, they sold seeding machines and cultivators made by Thomas, Ludlow & Rogers, of Spring-

field, Ohio, by authority under letters patent No. 152,706, granted J. H. and J. W. Thomas June 30th, 1874, but on information and belief deny that such machines infringe said re-issued letters patent, or in any way violate any right of complainants thereunder.

As to the other allegations of said bill these defendants are not informed save by said bill, therefore they deny the same, and leave the complainants to make such proof thereof as they may be advised.

And these defendants having answered said bill as fully as they are advised it is necessary for them to make answer, by way of further defense, say that the said complainants were not the
13 original, first and joint inventors of the alleged improvements described and claimed in said re-issue, but that prior to the patented invention thereof, the same or substantial and material parts thereof were shown and described in the following letters patent of the United States, to wit:

No. 7241 granted to L. Haverstick, April 2d, 1850, for grain drills.

No. 46654 granted to Henry Francisco, March 7th, 1865, for teeth for cultivators.

No. 47008 granted to Joseph Fowler and F. M. Bacon, March 28th, 1865, for hanging cultivator.

No. 18894 granted to D. Eberly, December 22d, 1857, for shovel plow.

No. 51768 granted to J. B. Whiting, December 29th, 1865, for seeding machines.

And in other patents which the defendants ask to be allowed to show as soon as the necessary particulars shall be obtained, and also in an application filed by William Parkman, of Ripon, Wisconsin, for letters patent for improvements in cultivators, when and by whom the said improvements were publicly used before the date of said alleged invention.

Wherefore these defendants say that the complainants are not entitled to an injunction, nor to an account, or any other relief against these defendants, as prayed for in their bill of complaint, without this, that any other cause, matter or thing, in their said bill of complaint, material or necessary for these defendants to make answer unto, is true to the knowledge or belief of these defendants. All which matters and things, these defendants are willing to aver, maintain, and prove, as this honorable court shall direct, and humbly pray to be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

WOOD & BOYD,
Sol's for Repondent.

STATE OF WISCONSIN, } ss:
County of Milwaukee, }

Edmund J. Lindsay and William Lindsay, the above-named defendants, make oath and say, that they have heard read the above answer and know the contents thereof, and that the same is true of their own knowledge, except as to the matters which are therein

stated on information and belief, and as to those matters they believe them to be true.

E. J. LINDSAY.
WM. LINDSAY.

Subscribed in my presence and sworn to before me, this 3d day of May, 1878.

EDWARD KURTZ, *Clerk.*

JUNE 1, 1878.

This day came the defendants, by their solicitors, and filed their supplemental answer, as follows, to wit:

14 *Supplemental Answer.*

Circuit Court of the United States for the Eastern District of Wisconsin.

JOHN S. ROWELL *et al.*,
vs.
E. J. LINDSAY *et al.* } In Equity.

The further joint and several answer of Edmund J. Lindsay and William Lindsay, defendants, to the bill of complaint of John S. Rowell and Ira Rowell, complainants.

These defendants, by leave of the court first had and obtained, by way of further answer, say, on information and belief:

That the alleged improvements described and claimed in said reissued letters patent were, prior to the alleged invention of the same, shown and described in letters patent of the United States No. 54089, granted to C. Atwood April 24, 1866, for improvement in grain drills, and were in public use at the following-named places, which uses were known to the following-named persons, respectively, to wit:

At Manor township, Lancaster county, Pennsylvania, which use was known to Levi Haverstick, and others residing at said Manor township.

At Delhi, Delaware county, Iowa, which use was known to B. S. Morgan, and others residing at said Delhi.

At the city of New York, New York, which use was known to J. and H. Secor, and others residing in said New York.

At Middletown, Dauphine county, Pennsylvania, which use was known to Archibald Wieting, and others residing at said Middletown.

At Waynesville, Warren county, Ohio, which use was known to David B. Eberly, now residing at Pine village, Warren county, Indiana, and to others residing at said Waynesville.

At Lawrenceburg, Dearborn county, Indiana, which use was known to Eli Brown, Austin Trulock, and David L. Thompson, and others residing at said Lawrenceburg; said Thompson now resides near Homer, Illinois.

At Circleville, Pickaway county, Ohio, which use was known to Mr. Newman, formerly proprietor of the Pickaway House, and others residing at said Circleville.

At Freeport and vicinity, Warren county, Ohio, which use was known to Jabez Hollingsworth, and others residing at said Freeport.

15 At Corwin, Warren county, Ohio, on the farm of William Thomas Smith, and other places, which uses were known to said Smith, who resides at said Corwin.

At Wayne township, Warren county, Ohio, on the farm of Clarkson Gance and Robt. F. Furnas, and other places, which uses are known to said Gance & Furnas, who reside in said township.

Wherefore these defendants pray as in their original answer they have heretofore prayed.

WOOD & BOYD,
Solicitors for Defendants.

STATE OF WISCONSIN, }
County of Milwaukee, } *ss:*

Edmund J. Lindsay and William Lindsay, the above-named defendants, make oath and say: That they have heard read the above answer and know the contents thereof, and that the same is true of their own knowledge, except as to the matters which are therein stated to be on their information and belief, and as to those matters they believe them to be true.

E. J. LINDSAY.
WM. LINDSAY.

Subscribed in my presence and sworn to before me, this first day of June, 1878.

[SEAL.]

BURTON HANSON,
Notary Public, Milwaukee Co., Wis.

16 June 3, 1878. This day came the complainants, by their solicitors, and filed their replication, as follows:

Replication.

f

United States Circuit Court, in Equity, for the Eastern District o Wisconsin, in the Seventh Circuit.

JOHN S. ROWELL and IRA ROWELL, Complainants,
vs.
EDMUND J. LINDSAY and WILLIAM LINDSAY, Defendants.

The replication of the above-named complainants, John S. Rowell and Ira Rowell, to the answer of the above-named defendants, Edmund J. Lindsay and William Lindsay.

These repliants, saving and reserving unto themselves, now and at all times hereafter, all and all manner of benefit and advantage of exception which may be had or taken to the manifold insufficiencies of the said answer, for replication thereunto say that they will aver, maintain, and prove their said bill of complaint to be true, certain, and sufficient in the law, to be answered unto, and that the said answer of the said defendants is uncertain, untrue, and insufficient to be replied unto by these repliants, without this, that any other matter

or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, and not herein and hereby
17 well and sufficiently replied unto, confessed, and avoided, traversed or denied, is true; all which matters and things these repliants are and will be ready to aver, maintain, and prove as this honorable court shall direct, and humbly pray as in and by their said bill they have already prayed.

JAMES J. DICK,
Solicitor and of Counsel for Complainants.

December 17, 1878. "On motion of James J. Dick, complainants' solicitor, ordered that this cause be set down for hearing at the next term of this court, commencing on the first Monday of January next."

February 21, 1879. This day came the parties, by their counsel, and on motion of the defendants it is ordered by the court that they have two months in which to take their testimony. And on motion of the complainants it is ordered by the court that they have leave to put in their testimony in open court.

March 25, 1879. This day came the parties, by their counsel, and on motion of the defendants it is ordered by the court that the order heretofore made herein be amended so as to read as follows: It is ordered by the court that defendants have sixty days in which
18 to take their testimony after the complainants have concluded their testimony, and that defendants have sixty days in which to take any rebutting testimony after defendants have concluded their testimony, and that they may take such rebutting testimony in open court.

April 21, 1879. This day came the parties, by their counsel, and on motion of the defendants it is hereby ordered that the order heretofore made herein, to wit, March 25, 1879, be, and the same is hereby, amended by striking therefrom the following, viz: "And that they may take such rebutting testimony in open court."

May 13, 1879. Stipulation of parties in regard to taking testimony filed.

August 25, 1879. Depositions of F. E. Saker, D. J. Woodward, and G. D. Rowell received from post office and filed.

October 17, 1879. Depositions of Griffith Hinchman and Jabez Hollingsworth, on behalf of defendants, filed; and same day deposition of Carroll Atwood, on behalf of defendants, filed; and same day depositions on behalf of defendants received per express and filed.

October 11, 1880. This day came the parties, by their coun-
19 sel, and by consent, it is ordered by the court that this cause be set for hearing on the twenty-second of October instant.

October 22, 1880. Depositions received from Francis Bloodgood, Esq., and filed.

Hearing.

October 23, 1880. This day came the parties, by their counsel, and this cause came on to be heard upon the pleadings and proofs, and

was argued by Messrs. J. J. Dick and A. R. R. Butler, for the complainants, and by Messrs. J. P. C. Cottrill and E. E. Wood, for the defendants, and the hearing not being concluded, the same was adjourned until Monday morning next, and supplemental answer filed, by consent, as follows:

20 *Amended and Supplemental Answer.*

United States Circuit Court for the Eastern District of Wisconsin.

JOHN S. ROWELL *et al.*,
vs.
E. J. LINDSAY *et al.* } In Equity.

Amended and Supplemental Answer.

The joint and several answers of Edwin J. Lindsay and William Lindsay, defendants, to the bill of complaint of John S. Rowell and Ira Rowell, complainants.

These defendants, by leave of court first had and obtained, by way of additional and supplemental answer, say, upon information and belief, that Thomas, Ludlow and Rogers are a corporation organized under the laws of Ohio, and are doing business in the city of Springfield, in said State; that said Thomas, Ludlow and Rogers manufacture seeding machines, which are sold to these defendants (who are dealers in agricultural implements) to sell to users; that before the alleged invention claimed in the reissued letters patent of complainant, dated March 31st, 1868, the same had been invented by C. Atwood, then and now residing in the town of Lebanon, State of Illinois, and who, upon due application therefor, did obtain letters patent of the United States No. 54089, bearing date April 24, 1866; that since the filing of the original answer herein by these defendants, said Thomas, Ludlow and Rogers have, by mesne assignments, duly made and recorded, became sole owners of all the right, title, and interest of C. Atwood, to and in said letters patent and invention for the State of Ohio, and various other territory in the United States, which assignment these defendants crave leave to offer in evidence.

Wherefore these defendants pray as in their original answer they have heretofore prayed.

EDWIN J. LINDSAY.
WILLIAM LINDSAY.

WOOD & BOYD,
Solicitor- and of Counsel.

By consent of parties the verification of the above answer is hereby waived and may be filed *nunc pro tunc*, as of the date of original answer, and replication on file to stand as replication to this.

WOOD & BOYD,
Solicitor- for Defendants.
J. J. DICK,
Solicitor for Complainants.

No. 2909

J. S. and Ira Rowell

Cultivator

Fig. 1.

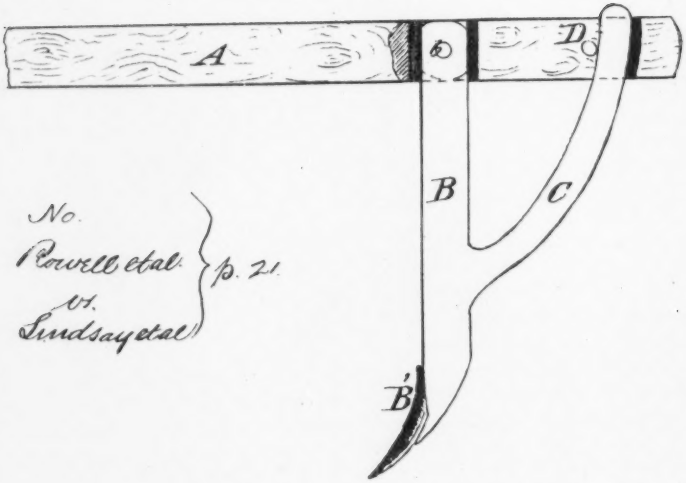

Fig. 2

October 25, 1880. This day came the parties, by their counsel, and the hearing of this cause was resumed, and being concluded, the court took the same under advisement, and on said hearing the following testimony was read in evidence, to wit:

22 *Complainant's Proofs. Direct Evidence.*

United States Circuit Court, Eastern District of Wisconsin.

JOHN S. ROWELL and IRA ROWELL
vs.
EDMUND J. LINDSAY and WILLIAM LINDSAY. } In Equity.

Testimony on reference under Rule 67, in equity, before Francis Bloodgood, examiner in chancery.

MILWAUKEE, *June 20th*, 1879.

Present pursuant to notice: For the complainants, Messrs. A. A. R. Butler and James J. Dick; for the defendants, E. Wood, Esq., of Cincinnati.

Plaintiff's Testimony.

The plaintiff offers in evidence a certified copy, the letters patent No. 2909, reissue, John S. Rowell and Ira Rowell, patentees, improvement in cultivators, dated March 31st, 1868, with the drawings and specifications attached thereto. It is hereto attached and marked "Exhibit A."

The following is the letters patent with the drawings and specifications referred to:

(Here follows diagram, marked p. 21.)

No. 2909. "A." Reissue.

THE UNITED STATES OF AMERICA.

To all to whom these letters patent shall come:

Whereas John S. Rowell and Ira Rowell, of Beaver Dam, Wisconsin, have alleged that they have invented a new and useful improvement in cultivators (for which letters patent were issued to them dated July 3, 1866, which letters, having been surrendered by them, the same have been cancelled, and new letters ordered to issue to them on an amended specification), and have made oath that they are citizens of the United States; that they verily believe that they are the original and first inventors or discoverers of the said improvement, and that the same hath not to their knowledge and belief been previously known or used; have paid into
23 the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents praying that a patent may be issued therefor:

These are therefore to grant to the said John S. and Ira Rowell, their executors, administrators, or assigns, for the term of seventeen years from the third day of July, one thousand eight hundred and

sixty-six, the full and exclusive right and liberty of making, using, and vending to others to be used, the said improvement, a description whereof is given in the annexed schedule, and made a part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office to be hereunto affixed.

Given under my hand at the city of Washington, this thirty-first day of March, in the year of our Lord one thousand eight hundred and sixty-eight, and of the Independence of the United States of America the ninety-second.

[SEAL.]

W. T. OTTO,
Acting Secretary of the Interior.
A. M. STOUT,
Acting Commissioner of Patents.

Countersigned and sealed with the seal of the Patent Office.

UNITED STATES PATENT OFFICE.

JOHN S. ROWELL AND IRA ROWELL, of Beaver Dam, Wisconsin.

Letters Patent No. 56102, dated July 3, 1866; Reissue No. 2909, dated March 31, 1868.

Improvement in Cultivators.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that we, John S. Rowell and Ira Rowell, of Beaver Dam, in the county of Dodge, and State of Wisconsin, have invented a new and improved cultivator, and we do hereby declare the following to be a full, clear, and exact description of the same, sufficient to enable those skilled in the art to which our invention appertains to make use of it, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of the tooth, in a beam shown in longitudinal section.

Figure 2 is a top view of the beam, with the tooth in position.

This invention consists in applying to the shank of the tooth a curved brace-bar, the upper end of which passes through a
24 slot or mortise in the beam, and is held in position by a clamping-bolt, which passes transversely through the slot or mortise near the brace-bar, and forces the sides of the beam together against the brace-bar, so as to clamp it in any required position, and thereby adjust the tooth in any inclination, at the same time allowing it to yield to immovable obstacles without breaking.

In the drawings, A represents one of the beams of a cultivator; B, the shank, pivoted at *b;* B′, the tooth; C, a curved brace-bar, extending in the arc of a circle outward and upward from the rear side of the shank B, and its upper end passing vertically through a longitudinal slot or mortice, *a*, in the beam A; and D a bolt, pass-

ing transversely through the slot or mortise, and having a head, *d*, on one end, and a nut, *d'*, on the other, by which the side walls of the slot or mortise can be clamped against the brace-bar with any required force, thereby holding the latter in position when operating in the field.

It is evident that in a device thus constructed and operating, the brace-bar C can be so clamped that the tooth will retain its position when working in arable soil, but will yield when coming in contact with an immovable obstacle, and pass over it without breaking, the shank turning back upon its pivot, *b*, and the brace-bar being forced up through the slot. The same arrangement also allows the shank to be adjusted in any position for deep or shallow cultivating.

The device above described may be cheaply applied, is of very simple construction, and has been found more effective, practically, than other devices designed to operate in a similar way.

Having thus described our invention, what we claim as new, and desire to secure by letters patent, is—

The combination of the slotted beam A, shank B, brace-bar C, and bolt D, when the parts are constructed and arranged to operate as and for the purposes herein specified.

JOHN S. ROWELL.
IRA ROWELL.

Witnesses:
J. E. HOSMER.
C. S. SNOW.

JOHN S. ROWELL called by complainant, and being duly sworn, testified:

Questions by Mr. DICK:

Q. Are you one of the patentees named in the letters patent just offered in evidence?

A. I am.

Q. Have you ever put the patent to any use since you obtained it?

A. I have.

Q. How?

25 A. Put it into practical use on the seeder.

Q. By manufacturing the machines mentioned in the patent?

A. Yes, sir.

Q. Have you manufactured the machines mentioned in the patent?

A. Yes, sir. We usually call it a seeder.

Q. How extensively have you manufactured or used the machine mentioned in the patent—seeder or cultivator?

A. We have built in the neighborhood of twenty thousand machines, and each machine requires thirteen of the teeth of our patent.

Q. Have you manufactured that number since the reissue?

A. Yes, sir.

Q. Since the reissue of this patent, or before, have you been interfered with or disturbed in the use of it?

A. Do I understand you by others using it? I have.

Q. Have you been interfered with or disturbed in your use of it by others?

A. Not at all.

Q. What have you done with those machines you manufactured?

A. Sold them.

Q. State whether or not the machines thus manufactured are useful; and, if so, in what respect.

A. They are useful. The first thing is to prevent breakage when coming in contact with obstructions; second, to enable us to adjust them to run deep or shallow.

Q. State whether or not these machines referred to are improvements; and, if so, of what.

A. They are an improvement on anything of the kind I know of, and one of the principal improvements is the simplicity and cheapness of them and their durability.

Q. State whether or not it is any improvement in the manner in which they work.

A. Well, the improvement is that they are not liable to get out of order.

Q. What do you refer to, not getting out of order; what part of the machine; the teeth or the rest of it?

A. The teeth. I mean the teeth being connected to the beam the way they are.

Q. State whether or not this cultivator or seeder mentioned in the patent is capable of the use for which it was designed?

A. It is.

26 Q. Can you state whether these machines you have testified you have made and sold are all in actual use, or how many?

A. I think there is not more than one hundred of them but what are in actual use. The probability is there is about one hundred that are not in use. Possibly not as many.

Q. What do you mean by saying one hundred not in use?

A. In our sales we will sometimes have a few left at some point unsold. I do not know how many there are this year, as we have not settled with all our customers. I suppose about 100.

Q. State whether or not this improvement cheapens the manufacture.

A. It does, quite a considerable. It costs less to manufacture than any other adjustable tooth, what we call slip tooth.

Q. State whether or not the patentees, yourself, and Ira Rowell have given licenses for the use of this improvement in cultivators.

A. We have licensed different manufactures.

Q. To what extent?

A. Well, I should say from $5,000 to $8,000. We have received from $5,000 to $8,000 for licenses to manufacture. I am only guessing, because I have not the figures.

Q. What is your business?

A. Manufacturing this machine.

Q. How long have you been engaged at it?

A. I have been engaged at this machine—not this particular one—I have been manufacturing for thirty years and over.

Q. State whether or not you are acquainted with manufacturing wood and iron machines of this kind.

A. I claim to be—at least I ought to be.

Q. State whether or not you have labored at it yourself.

A. I always worked myself until the last seven or eight years, and I do some yet, not very extensively.

Q. State whether or not a mechanic of ordinary skill in this kind of work could make your machine from the specifications in your patent—from the specifications and drawings.

A. Very easily; any ordinary mechanic.

Q. State whether or not the specifications in the patent, together with the drawings, are sufficient guide for an ordinary skilled person in the trade to make your machine.

A. They are.

Q. Are you acquainted with the defendants, Edmund J. and William Lindsay?

27 A. I am.

Q. Where do they reside?

A. Milwaukee, Wisconsin.

Q. In what business are they engaged?

A. In the sale of agricultural implements.

Q. State whether or not they have been engaged in the sale of the Superior drill, manufactured by Thomas, Ludlow & Rogers, of Springfield, Ohio, Superior drill or seeder.

A. So far as I can say, they told me they was. I have talked with them and have seen the machine; they showed me the sample and told me how many they had sold.

Q. When was this?

A. At different times, two or three years ago. I have been there often, to their establishment.

Q. Since the reissue of your patent?

A. Oh, yes, sir.

Q. Did you see the machine they sold?

A. Yes, sir.

Q. And the tooth that was used with it?

A. Yes, sir.

Q. State whether or not the tooth and beam were like this.

(Shows witness tooth and beam.)

A. Yes, sir.

Q. The tooth in the machine they sold, the Superior seeder, was like this?

A. It was the same thing.

Tooth and beam referred to offered in evidence and marked "Defendants' tooth and beam."

(Shows another tooth and beam to witness.)

Q. State whether or not this tooth and beam are made according to the specifications and drawings of the patent offered in evidence.

A. They are.

Q. State whether or not this tooth and beam are made for actual use in that machine according to your patent.

A. They are.

Q. State whether or not the machine you have testified to having made and sold had the same tooth as this.

A. They have this identical tooth and beam.

28 Plaintiff's counsel offers in evidence the tooth and beam referred to. It is marked "Plaintiff's tooth and beam."

Q. State whether or not the device of the defendants, consisting of the tooth and beam just offered in evidence, is identical with the device consisting of the tooth and beam of the plaintiff, just offered in evidence.

(Objected to by defendants' counsel.)

(Question withdrawn in that form.)

Q. Will you point out the points of actual resemblance between the device of the defendant, consisting of the tooth and beam just offered in evidence, and the device, consisting of the tooth and beam of the plaintiffs, just offered in evidence?

A. In the first place, the two beams are slotted out to the end back about eight or ten inches; and in the next place there are two holes bored through here, that admit two bolts or pins in each beam. In the next place, there is what we call a clamping bolt, set just forward of the shank or brace in each beam alike; and these clamping bolts are drawn up to hold the brace or shank the same. The only difference in the connection of this shank, or tooth as we call it, and beam, is the form of the tooth. They are held in position identically.

Q. Point out the difference, if any.

A. In the beam there is no difference. The holes are closer together in one than in the other. There is a similarity in the shank. They are the same here, but different in connecting the brace; the shank and tooth are the same, but the brace is in different form. Their brace is bent over in a circle, and our brace is welded on and bent in a circle, welded on to the shank, and they are hung on a pivot the same.

Q. Any other points of difference?

A. The power of holding them is the same identically, and by the same piece, that is by the beam, both held by the beam, by clamping the beam together.

Q. Now state if, in your opinion, the differences in these two teeth are material.

A. My opinion is they are not.

Q. Now state whether or not in your opinion their points of resemblance are the same.

A. The points of operation and principle of the two devices are identical.

Q. State whether or not in your opinion the points of difference between the two devices, consisting of beam and tooth, are important or not.

A. They are not.

Q. State whether or not in your opinion the changes, if any, differing from the device of plaintiff, introduced in the device
29 of the defendant consisting of the tooth and beam, is merely the substitution of one mechanical equivalent for another.

(Objected to by defendants' counsel.)

A. That is all it is.

Q. State whether or not in your opinion the changes, if any, in the device of the defendant, where it differs from the device of the plaintiff, constitutes any real change of structure affecting the substance of your invention.

(Objected to, as leading and incompetent.)

A. If I understand the question rightly, I think it does not constitute any change. The operation is the same. The structure is nearly the same.

Q. State whether or not in your opinion the device of the defendant, consisting of the tooth and beam just offered in evidence, is substantially the same thing as the device of the plaintiff, consisting of the tooth and beam just offered in evidence.

(Objected to, as incompetent and leading.)

A. They are substantially the same.

Q. State whether or not in your opinion the difference of form between the device of the defendant offered in evidence and the device of the plaintiff offered in evidence is real or only apparent.

(Objected to, as before.)

A. It is only apparent.

Q. State whether or not in your opinion the device of the defendant offered in evidence is new in its mode of operation.

(Same objection as before.)

A. It is not.

Q. State whether or not in your opinion the defendants' device is new in structure; what I mean by new in structure is in the sense of the patent laws.

A. It is not, in the sense of the patent laws. They are changed a little in form.

Q. State whether or not in your opinion that little change of form you speak of in the defendants' machine is material or not.

A. It is not material.

Questions by Mr. BUTLER:

Q. With the specifications and drawings accompanying your letters patent, could a mechanic of ordinary skill construct this tooth and beam of the defendants?

(Objected to, as incompetent.)

30 A. I think he could. I will give my reasons. I think there is no limit for the construction of the forms of the tooth after the slot in this beam is invented and those two bolts in their places.

Q. Did the change made from your device in the construction of the device of the defendant involve invention or mechanical skill only?

(Objected to.)

A. Mechanical skill only.

Question by Mr. DICK:

(Shows witness model.)

Q. State whether or not the model of the plaintiffs' device just shown you is constructed after the specifications and drawings of your patent.

A. It is.

(Model referred to offered in evidence by the complainant, and marked "Exhibit No. 1.")

(Shows witness another model.)

Q. State whether or not the model just shown you is in construction and form similar to the device of the defendant heretofore offered in evidence.

A. It is.

(Model referred to offered in evidence by the complainant, and marked "Exhibit No. 2.")

(Shows witness another model.)

Q. State whether or not you have ever manufactured any tooth and beam similar to the model just shown you.

A. The first tooth I ever made on this principle is this, before my patent was issued. That is of this slotted beam.

(Model referred to offered in evidence by the complainant, and marked "Exhibit No. 3.")

Q. State how you came to manufacture your device in the form that it is now.

A. Well, I found this to be made of lighter iron. I could use lighter iron by having a brace on the back; by welding a brace on I could use lighter material, and make it strong enough for common use.

Q. State whether or not, in your opinion, it is of any practical value having a loop to that tooth, as shown in model No. 3.

A. I could use as thin material in this as that, but it cost me that much more stock.

Q. State whether or not, in your opinion, the model No. 3 is identical with the device of the plaintiffs offered in evidence.

31 (Objected to, as incompetent.)

A. It is substantially the same, and identical in its operation.

Q. State whether or not, in your opinion, the model No. 3 is identical with the device of the defendants offered in evidence.

A. It is the same. It is identical in operation, and substantially the same.

Q. State whether or not, in your opinion, the form of the defendants' tooth adds anything to its usefulness or cheapness.

A. No, sir; it does not.

Q. State whether or not you know whether the defendants are partners or not.

A. They are. They were partners, and I presume they are now.

Q. State whether or not the patentees, John S. and Ira Rowell, have ever given any right to the defendants to sell or use their device offered in evidence.

A. They have not.

Q. State whether or not Thomas, Ludlow and Rogers, the manufacturers of the Superior seeders, have ever paid you royalty or not on the slip tooth, your device.

A. Thomas and Nast have.

Q. Is the Thomas in the firm of Thomas and Nast the same Thomas who now manufactures the Superior seeder, Thomas, Ludlow & Rogers?

A. I understand he is the father; the old gentleman paid the royalty. They are not the same man. I understand he is connected with this firm, but I don't know that he is. I supposed he was the same man until lately. I understand now it is his son.

Admission: It is admitted on the part of the defense by the counsel in open court that they are engaged in selling, and have sold seeding machines manufactured by Thomas, Ludlow and Rogers, of Springfield, Ohio, called the Superior seeder, which contains teeth and beams identically like the exhibit offered in evidence in this suit, marked "Defendants' Tooth and Beam." That such sales were made between the date of the reissue of the patent offered in evidence and the beginning of this suit.

Q. State whether or not the patentees were the first inventors of the device offered in evidence by you.

A. We are, so far as I know.

Question by Mr. BUTLER:

State whether or not your device offered in evidence was new at the time of its invention?

A. It was, so far as I had ever seen or heard anything, before or since.

32 Cross-examination:

Q. When did you commence to manufacture slip tooth cultivators? In what year?

A. I commenced manufacturing my original patent in 1862.

Q. In what year was your original patent obtained?

A. In 1862.

Q. How long did you manufacture cultivators under that patent?

A. Until 1865.

Q. And manufactured all the 1865 season?

A. In the year 1865 I manufactured of both kinds. A very few of this kind like plaintiff's model No. 1. Only one like model No. 3.

Q. How many did you say you had made like plaintiff's model No. 1 in all?

A. Well, I cannot tell exactly, but from fifteen to twenty thousand of the machines. Our books will show.

Q. In the old tooth the brace or clasp extended from the shank forward to the beam, did it not?

A. Yes, sir; that is, embraced the brace or shank here, and made rigid in the beam. Before the beam it runs up forward, and made rigid in here.

Q. Of what use in your present device is that brace which is attached to the shank and runs backward?

A. To get a distance from here to here, and at the same time to stiffen the shank, to make a light shank. This brace allows us to use a lighter shank here by putting this on. And not only that, it is very essential to get a distance from this pivot to the clamping point to give it a leverage. If it was clamped at the pivot it would not hold.

Q. It stiffens the shank to have the brace welded on between the tooth and beam, does it?

A. Yes, sir; it does. And allows us to use a lighter material for the shank than we would without it.

Q. That is the reason it is attached so low down, for stiffness and lightness?

A. Well, to get room for it to operate here, between the jaw also, and for the two purposes—for both purposes.

Q. You could attach it clear up, and make a square corner of it inside of the beam, and still get distance? But my question is, You attach it in that manner for stiffness and lightness?

A. That is the way I understand.

Q. You speak about having licensed several parties, as I understand you?

33 A. Yes, sir.

Q. And obtained $6,000 or $8,000?

A. Yes, sir.

Q. Whom did you license?

A. Fond du Lac Seeder Company, Seeder and Wheel Company, also Van Brunt & Davis, and Van Brunt & Barber, and the Appleton Manufacturing Company, and I think some few other small parties.

Q. Did Van Brunt and Van Brunt & Barber take a license under your former patent, as well as under the latter patent?

A. Not under the former, under this patent. It is the tooth they used, the identical form. I don't know what their license might have read, but I know what the contract was; they might have put that in.

Q. How was it as to others? Do you know whether or not both patents are named in the licenses?

A. I don't remember. I could not tell you. That is the tooth they wanted to use, not the other, and did use.

Q. When did you first tell Messrs. Lindsay you were going to bring suit against them?

A. I don't know that I ever told them so. I might have possibly.

Q. You thought they were infringing, so brought suit?

A. Yes, sir; I believed they were.

Q. What relation is Ira Rowell to you?

A. Nephew.

Q. Which of you got out or invented the form shown in model No. 3, yourself or Ira?

A. Well, we both suggested ideas in getting this machine up. We were partners, and what we were after was to get up a tooth that would not let go when it was pulled back; still retain its grip. We had one that would slip out, but our object was to get one that would not let go. After talking and comparing notes, etc., we finally invented this, or got this up.

Q. Was this form of tooth in model No. 3 an old form, well known to you?

A. The bow was.

Q. That goose-neck loop?

A. Yes, sir; I had seen a bow similar to that, but not held in that form.

Q. Suppose in model No. 3, if instead as now, the bolt passed through the rear part of the loop to form a pivot, and the clamp was made continuous upon the front part of the loop, would it be a material change in the construction, in your opinion?

A. It would make a material difference in the construction of this tooth.

34 Q. On the other hand, if the defendant had pivoted the shank to the rear portion, and applied their continuous clamp to the front end, you would not complain of their infringing your patent?

A. Not unless they slotted this beam out, and drew the two walls of the beam against the shank or brace.

Q. Even if they got the same result by a continuous clamp from the front end of the bow?

A. Unless they clamped by the use of the beam. I can't understand exactly this continuous clamp, what they might invent, but I answer like this: Unless they slotted the beam out to the end, and used the beam for the clamp, I should not consider it an infringement.

Q. Well, then, if somebody before you has invented the same continuous clamp that you speak of, your novelty would consist solely in making a slot or opening in the beam, would it?

(Objected to, as calling for a legal conclusion.)

A. It would not; that is, it does not consist solely in this. I have no doubt but that has been made a continuous clamp; I have no doubt but it has been made.

Q. Then you don't claim to be the inventor of that, but only your particular mode of doing it?

A. No; I don't know that I do particularly; that is, I don't know but that I am the first. I can't say that is a thing I ever thought of, particularly, whether I was or not.

Q. You are quite certain that if the shank is pivoted to the rear portion instead of the front, by the defendants, you would not claim it an infringement?

A. If they did not use the slotted beam to produce the clamp I should not think it an infringement.

Q. So, if he extended it a little longer, and prevented the beams from coming together, making the ends of the beam solid, you would not consider it an infringement, would you?

A. I don't know but he might extend it far enough out, so he would embody the same thing. It never had been done, to my knowledge, when I patented this.

Q. The principal point of your claim is using a slotted beam on which to clamp the standard, is it?

A. Really my claim is what is embodied in that; referring to his model; there is no machinery that holds that tooth, except the beam and clamp.

Question repeated.

A. You have an answer; that is the only answer I can give.

35 Q. If I understand you, the principle point of your claim of invention is using the slotted beam on which to clamp the standard, is it? Do you mean to be understood so?

A. In connection with the clamping-bolt and pivot and shank as it is embraced.

Q. Do you think in practice it would materially change the operation of defendants' device if the pivot passed through the rear portion of the tooth, and instead of a bolt to clamp the front he should apply a set screw, so as to furnish a continuous clamp.

A. I don't, if he give room here for these two pieces of wood—there would be two pieces there—and sufficient room here so as to clamp the wood, the two pieces of wood against the brace or shank. If the slot was extended long enough.

Q. You don't understand me; instead of using a through bolt they were to use a set screw, which is made to bear continuously upon the neck of the tooth. I want to know if that, in your opinion, would substantially change the operation?

A. I think a set screw would materially change it. I think a set screw has nothing to do with it whatever. I think a set screw and this clamp is entirely different for this purpose.

Q. Are you familiar with the slip tooth made by Esterly?

A. I am.

Q. Are you familiar with those made by the Harris Manufacturing Company?

A. I am.

Q. How much do you claim you save in cost over either one of these two?

A. On a machine it is acknowledged that we save, they claim we save, a couple of dollars or two dollars and a half on a full machine.

Q. How much would that be a tooth?

A. I don't know; I would have to figure on it.

Mr. BUTLER: It would be about 20 cents a tooth saved.

Q. How is this 20 cents a tooth saved?

A. In labor and material.

Q. How much in labor, and how much in material?

A. I am taking their words. I told you they acknowledged this. Not that I had ever made any figures; I had never figured it, only I know it makes a difference.

Q. I am after your knowledge of it. What do you think it saves, and how?

36 A. From any tooth I ever manufactured outside of this, I can save from one to three dollars on a machine.

Q. You are speaking of your first patent?

A. Yes, sir; of the first.

Q. Have you ever made any other slip tooth except under the first patent and this one, and model No. 3?

A. Very few. Only experimenting.

Q. Now, do you think that you save as much as 20 cents a tooth in labor and material over the kind manufactured by the Harris Manufacturing Company?

A. For us; I have not made the tooth, you understand; only from the looks of the tooth, and the way it is constructed in different parts, I should think it would come very near that, if not quite.

Q. Where would the saving be principally; in labor or material?

A. Both.

Q. About even?

A. You are asking me something I never figured on particularly, only as we have looked at it and talked about it some years ago, and found that the Harris and Esterly tooth were quite expensive side of ours.

Q. You don't know whether this saving is more in the cost of labor or more in the cost of material?

A. I could not tell. I think the time has been when it would be in the material a good deal; when iron was higher, more than now.

Q. Were you making your estimate of from one to three dollars a machine with any reference to the cost of labor and material?

A. That is where we make our estimate.

Q. And as labor and material are now, prevalent prices, what do you think it would save of the cheapness, making your tooth over either the Harris or Esterly?

A. I could not tell you exactly, because it is something I have not looked close to it; have not figured particularly. It would be folly for me to undertake to, only I can say this: their tooth cost more than this one, how much more I don't know.

Q. In your direct examination, when you spoke about your cheapening labor you were speaking of only your own experience in the kind of tooth you had made, were you?

A. I speak from facts. I know that one is more than the other, because those teeth are made very similar to my old tooth. The expenses are identically the same, and this one is very much quicker made with less machinery; it is merely a saw that saws this
37 slot in; it is done in an instant. The other had to be mortised with a mortising-machine; consequently, this is made four to one quicker than the other.

Q. Then your principal saving is in labor?

A. Yes, sir; one.

Q. How much in weight of material do you save over your old tooth?

A. Well, considerable.

Q. About how much?

A. I should think maybe two or three pounds of iron, probably. I am only guessing at that. I should judge two or three pounds less than what we made the old tooth with, possibly more, counting the heavy jaw brace; the fork brace we call it; and we used the same material in the work that we do in this, and lessen it in material considerably.

Q. What is the cost of iron; what has it been for the last two or three years, such as you would make this tooth from?

A. Two and one-eighth cents a pound.

Q. Has it been over two or three cents a pound for the last two or three years?

A. Not including freight; not over three or three and one-half, somewhere near that.

Q. How many of the old machines did you manufacture and sell; about how many?

A. I guess from fifteen to eighteen hundred; I have a memorandum somewhere; I don't know now.

Q. What license do you charge for manufacturing?

A. I think two and one-half dollars a machine.

WITNESS: This tooth was not licensed on account of its cheapness and simplicity, but its durability and perfect operation; that is what the whole thing stands to the head for in this country.

Q. What was the name of that old tooth that you had seen with the loop running clear around?

A. A nephew of mine made one once, I believe the first tooth of that kind; a man by the name of Rowell.

Q. Did he use it in the seeder?

A. No, sir.

Q. Was a tooth like that made and on the market years ago?

A. No; not like that. There was a tooth with a cam shape. It was pivoted at the rear here, and forms a cam that it slips by. That was made at Lake Mills.

Q. Whom by?

38 A. I have forgotten the man's name. He is dead now. Esterly undertook to use it. It is not like this.

Q. What do you understand to be invention?

A. My idea of it is when a man has got up something that is

different from something else, and produces a good result, and is new; that is an invention.

Q. I understand you to say you do not know that you are the first one to apply a continuous clamp to the slip tooth, but that you think your invention is in doing that by clamping. Do you mean to be understood that way?

A. I mean to be understood that I think I am the first inventor of the continuous clamp by means of using the beam for the clamping—clamping with the beam.

Q. And the chief advantage that you obtain by your construction is in the cheapness and ease of manufacturing?

A. That is one of the advantages. The other is a superior machine to any other of the kind in its operation and durability—to any other that I have ever seen.

Q. Why is it superior in operation? In any other sense than because it is a continuous clamp?

A. Not altogether for that. Out of the 15,000 or 20,000 machines we have sold there has never been one of those machines ever found fault with by the user, not one, neither by the dealer or the user, and I have not seen any other tooth but what got out of order occasionally, and some pretty often.

Q. Did that old tooth use to get out of order?

A. It did.

Q. Used to break?

A. Yes, sir.

Q. Where would it break usually?

A. They used to draw upon the clamp sometimes, and the clamp against the iron, and they used to draw up and break the clamping screw.

Q. Break the shanks?

A. It used to bend them sometimes by their being clamped too hard. And they would break the clamping screw, and occasionally bend the shank when they clamped them too tight. The iron would not yield like the wood.

Q. I notice in this model the brace has less thickness at the top than at the bottom. Was that made intentionally?

A. It is not; the iron was made the same; we propose to
39 have it the same. We were perhaps not particular in making this model and got it a little thicker.

Redirect examination.

Q. You speak of your nephew having made a tooth with a loop. Please explain what sort of a tooth that was. Give it fully and clearly.

A. It was very much like this Lake Mills tooth, with a cam shape here, and a little roller in here for it to strike, with the roller on a pivot someway, the roller pivoted out of center, and this loop pivoted at the rear end in a mortise, not in a slot. What I call a mortise, a solid beam at the end, not slotted out, but a long mortise in here; the end was solid.

Q. State whether it was clamped or fastened in the manner of your device.

A. The loop was not clamped at all. It was intended to operate this cam on the wheel at the loop.

Adjourned until Saturday morning, at half-past nine.

SATURDAY, HALF-PAST NINE A. M.

(Same appearances.)

(Examination of JOHN S. ROWELL continued by the complainant.)

Questions by Mr. DICK:

Q. When you speak of the original patent in your answer on the cross-examination, what original patent do you refer to?

A. I refer to the patent issued to us in 1862.

Q. Is it the original patent on which this reissue was granted offered in evidence? Is this original patent you speak of the original patent on which the reissue offered in evidence was granted?

A. No; it was a prior patent.

Q. You have answered on your cross-examination that this tooth was not licensed on account of its cheapness and simplicity, but its durability and perfect operation. Does this express your meaning fully? If not, how do you mean to be understood?

A. I should have said not "wholly" on account of its simplicity and cheapness.

Recross-examination.

Q. Was not that former answer read over to you two or three times yesterday, at the time it was given?

A. I guess so, but it don't sound very well, the way I had answered it there. I really meant to be understood when I said "not" I meant not wholly. That is what I meant to express, but I guess I did not do it. You had asked the question before—some question, I forget now what it was exactly—about this license.

Q. Did you suggest correcting this answer until Mr. Dick called your attention to it here in conversation?

A. When he read it over it did not sound as I meant; it seemed as though the reporter had left out something, or I, because it was not according to the real facts.

Q. Is this superior operation due to the fact that the beam is made of wood, and clamped in the manner shown in your model?

A. It is.

Q. Then if the beam were made of iron of exactly the same character except reduced in size to get the proper strength, would, it in your opinion, materially change the character or operation of the device?

A. It might operate, but not with the perfection that this would; it might operate.

Q. My question meant, would it materially change it so you would call it substantially a different mode of operation. How do you want to be understood?

A. No, I should not think it would be a material difference if those were iron—I mean those jaws.

Q. If you could make one side iron and one wood so it would clamp by a bolt, would that make any material change?

A. In the mode of its operation?

Q. Yes, sir.

A. It would be hard to answer a question of that kind, because one is better than the other. By actual use this is proven to be better than the other. I have seen them both used.

Q. Wood is better than iron, you mean?

A. Yes, sir.

Q. But still you would not consider it a patentable difference between them?

A. Yes, sir, I do. I consider you can produce this result with either of those you speak of; that is, you can produce the machine.

Q. Either with the beam made all of iron or partly of iron, you mean?

A. No.

Q. Then, if I understand you, it is essential to the successful operation of your device under your patent that the beam should be made of wood, and clamp in the manner shown?

A. Yes, sir.

41 Q. Would you or not complain of an iron beam made with your form of tooth, having the same construction; that is, clamping in a slotted end?

A. I should.

Q. And yet you would consider it materially different from your wooden one in operation?

A. You have got two or three questions there mixed up. Start out new and maybe I can get through with it.

Q. I want to understand you just as you mean. I simply want to find out whether or not the successful operation of your invention necessitates the use of the wooden slot on the beam, clamping the brace and the shank in the manner shown, or whether if a metal beam, with a metal slot were substituted, such a change would materially affect the operation of the device in your opinion.

A. My opinion is this: That a wooden beam would be far superior to an iron beam, although the iron beam would operate rather rudely, if I might use that word; it might operate, but the wooden beam we know is far superior to it, supposing there was one of that kind; supposing there was an iron beam made, in our experimenting we found the wooden jaw far superior to iron for this purpose.

Q. Is there such a difference in the character of the operation between metal and wood clamping your brace and shank that you are able to state whether or not in practice to the farmer the difference is substantial?

A. I consider that the difference that we have produced in this model, or in model No. 1 here, is patentable, and I think would naturally cover a beam made of iron.

Q. I am not speaking about what the patent covers. I am trying to find out whether or not, practically in the hands of the farmer,

the substitution of metal for wood would or not materially change the character of the operation, durability, etc., of the device?

A. I think it would materially change it. We know it by experience.

Questions by Mr. BUTLER:

Q. Do you mean by your last answer that it would be materially less effective for the purposes for which the device is used, or do you mean that in case the beam were made of iron it would be so materially different from your device as that your letters patent would not embrace it?

A. I do not know for certain whether I comprehend the question.

Q. Do you wish to be understood that a machine constructed like yours, with the exception that the beam is made of iron, would be less effective, less useful in actual operation in the hands of the farmer than your machine, or what do you mean?

A. That is just what I mean; it would be less effective and useful to the operator.

42 Q. Did you intend to express the opinion that in case an iron beam were to be substituted for your wooden beam that your patent would not be infringed?

A. I did not.

By consent of parties the signature of the witness, John S. Rowell, is waived.

SAMUEL ROWELL, called on the part of the complainant, and being sworn, testified.

Questions by Mr. BUTLER:

Q. You are a son of the last witness, John S. Rowell?

A. I am.

Q. What is your age?

A. Twenty-seven.

Q. What is your occupation?

A. Machinist, practical machinist, pattern maker.

Q. How long have you been engaged in the occupation of a machinist and pattern maker?

A. For the last 8 or 10 years.

Q. At work at your profession in the shops of John S. Rowell, Sons & Co.?

A. Yes, sir.

Q. You are one of the firm, are you not?

A. Yes, sir.

Q. Have you had any experience in the manufacture of the plaintiffs' cultivator tooth?

A. I have; a good deal.

Q. Did you make these models?

A. I did.

Q. What is model No. 1 intended to represent?

A. It is made from the drawings of our reissue of patent?

Q. Made from she drawings and specifications contained in the letters patent in the reissue, which are in evidence?

A. Yes, sir.

Q. In saying "our patent," you mean the patent of the plaintiffs' in this case, do you not?

A. Yes, sir.

Q. Does that accurately represent the cultivator tooth and beam described in the letters patent on file?

A. It does.

43 Q. What is model No. 2—you made this model, made them all?

A. Yes, sir.

Q. What does that represent?

A. The Superior seeder, tooth, and beam.

Q. Manufactured under what patent; do you know?

A. Under the patent of Thomas, Ludlow and Rogers.

Q. And that is the device, or tooth and beam of the defendant, is it?

A. Yes, sir.

(No. 3 referred to.)

Q. What does that represent?

A. That represents the first tooth of this kind we ever made.

Q. The first tooth your father and his associates ever made?

A. The first tooth with the slotted beam.

(The counsel for the defendants objects to the counsel for the complainant repeating the answer of the witness, calling for a direct answer.)

Q. Will you examine this tooth and beam marked plaintiffs' tooth and beam, and state whether this is the tooth and beam actually used in the manufacture of machines by the patentees.

A. It is.

Q. Examine this tooth and beam marked [Defendants' Tooth and Beam] and state whether or not the latter operates in the same way or differently, and accomplishes the same purposes, or different purposes.

(Objected to, as leading and incompetent by defendants' counsel.)

A. It operates in the same way exactly. It accomplishes the same purposes exactly.

H. Have you ever seen the defendants' machine in actual use?

A. I think I have seen them. I have seen about all the seeder machines in use.

Q. And you think you have seen this in use?

A. I think I have.

Q. What is the difference between the complainants' beam and tooth and the defendants' beam and tooth here in court; in the construction of them, I mean?

A. Simply a change of form in the shank.

Q. State whether a mechanic of ordinary ingenuity and skill,

with the specifications and drawings accompanying the letters patent in evidence here, could make the beam and tooth of the complainants.

A. I think he could, very easily.

Q. State whether such a mechanic, with the same specifications and drawings before him, could not construct the beam and tooth of the defendants with the changes you have referred to.

44 A. I think he could just as easily.

Q. What do you say as to the materiality of the changes made in the tooth and beam of the defendants from the form of the tooth and beam of the complainants?

A. I think it is no material change.

Q. In general terms, how extensively is this tooth of the plaintiffs used among the farmers of the northwest—I mean the machine made by your firm at Beaver Dam with this form of tooth and beam?

A. They are used very generally.

Q. With what degree of satisfaction by farmers, so far as you have experience and observation?

A. With perfect satisfaction always.

Q. About how many do you manufacture yearly?

A. We manufacture from 1,200 to 2,500 machines.

Q. What becomes of them?

A. All sold, most of them. Well, they are all sold; a few carried over from year to year, but they are all sold in time.

Q. Sold to and used by farmers?

A. Yes, sir.

Q. Is there or not any substantial difference in the construction, operation, or use of these two devices—the device of the tooth and beam of the complainants and the tooth and beam of the defendants?

A. There is no substantial difference.

Q. Do the changes, or do they not, in the form of the defendants' beam and tooth, and from the form of the complainants' beam and tooth, involve invention or only and merely mechanical skill?

A. That is all—merely mechanical skill.

Q. Is it or not your opinion that any ordinary mechanic, having seen this beam and tooth of the complainants in actual use and operation, could not construct such a beam and tooth as the defendants here in court?

A. I think a mechanic could—any good mechanic.

Q. With or without difficulty?

A. Without any difficulty.

Cross-examination:

Q. What is the retail and wholesale prices of your seeders?

A. The retail price is about $50.00; the wholesale price is about $38.00 to $40.00 or $42.00.

Q. How do your prices compare with those of your competitors?

A. They are all about the same.

45 Q. Do you print a circular or advertising book of your manufactures?

A. Yes, sir.

Q. Giving all the prices and information?

A. Yes, sir; we give the prices, but we vary upon the price some.

Q. What is the necessity of that pivot which goes through the shank of your device?

A. It is to hold the standard in place from slipping out.

Q. Could you work without it?

A. No, sir.

Q. In practice did you ever make the brace straight?

A. Yes, sir.

Q. Do you usually, in practice, make them straight or curved?

A. We make them any way; they all work about the same.

Q. Does the exhibit marked "Plaintiffs' Tooth and Beam" represent the general shape of your manufacture?

A. It does.

Q. What do you understand invention to be?

A. I understand it to be any new idea of a man that has never been used before; something that will accomplish a useful purpose.

Q. In practice, what part of plaintiffs' tooth sustain the strain that comes upon it?

A. There is a strain on all of it.

Q. Won't you explain how the strain is imparted to the beam from the point of the tooth?

A. The strain comes on the brace. It is necessary to have a brace.

Q. When it meets with a sudden shock the strain upon the brace is greater than in ordinary cultivating, is it not?

A. Yes, sir.

Q. Much greater?

A. Much greater.

Q. How long did you say you had been in the business?

A. I have worked ever since I was a boy at practice in the shop.

Q. About how many years have you been at work in the shop?

A. When I went to school, when I was 12 or 15 years old?

Q. You have worked off and on since you were 12 or 15 years old?

A. Yes, sir, up to this time.

Q. And since you have gotten to be a man you have spent all your time in the shop?

46 A. Yes, sir.

Q. And you are very familiar with the business?

A. Yes, sir.

Q. How long have you been a member of the firm?

A. About three years.

Q. Are you interested pecuniarily in the result of this suit as a member of the firm?

A. I am; yes, sir.

Q. Do you know the weight of your tooth attached to the beam?

A. I don't remember exactly; I have known it.

Q. What thickness of iron is it made of?

A. Three-eighths.

Q. Of bar iron?
A. Yes, sir.
Q. Shaped and welded?
A. Yes, sir.
Q. Does the blacksmith have a form to make the tooth by?
A. Yes, sir.
Q. Have you ever made any with the brace further up and of a more curved form?
A. Yes, sir.
Q. Which do you find the best?
A. We find it makes but very little difference; any shape we mind to get in that slot there is just as good as the tooth in evidence.
Q. How long have you been making the tooth according to the form represented in this exhibit?
A. We have made them ever since the patent was got out.
Q. That is the general shape you conform to?
A. Except a few; and this loop shape we put in along at first.
Q. How many?
A. I could not tell how many; we never made but a few of them.
Q. Half a dozen?
A. More than that.
Q. Several hundred?
A. We made—I could not tell; we might have made a hundred or not as many; they are two expensive.
Q. How much more would they cost a machine as labor and iron are now?
47 A. They cost almost—I can't tell you how much more iron there is in them; there is enough iron extra in there to make half another tooth, another tooth.
Q. How much more does the labor cost; as much more?
A. The labor would not amount to as much as the extra stock; it is done by machinery.

Re-direct examination by Mr. DICK:

Q. Are you one of the owners of this patent?
A. I never bought any interest in the patent.
Q. State whether or not you are otherwise interested in the patent except in the manufacture of these machines.
A. That is all; in the manufacture.
Q. You are not a party at interest in this suit?
A. I am not interested in the suit as an owner of the patent.
Q. State whether or not you are otherwise interested in the manufacture of these machines except those manufactured by your company at present.
A. That is all.

Stipulation.

It is hereby stipulated that in place of the original letters patent which have been offered in evidence and received that the complainant shall be permitted to file a certified copy thereof at any time before the trial.

By consent of parties, the signature of the witness Samuel Rowell is waived.

48 *Rebutting Evidence.*

United States Circuit Court, Eastern District of Wisconsin.

JOHN S. ROWELL & IRA ROWELL
vs.
EDMUND J. LINDSAY & WILLIAM LINDSAY. } In Equity.

Testimony on reference under rule 67 in equity. Before Francis Bloodgood, examiner in chancery.

MILWAUKEE, *October 18th*, 1879.

Present pursuant to notice: For the complainants, Messrs. A. R. R. Butler and James J. Dick; for the defendants, E. Wood, Esq., of Cincinnati.

Plaintiffs' Rebutting Testimony.

MELVILLE E. DAYTON, being duly sworn, testified:

Q. 1. State your name, residence, and occupation.

A. 1. Age, 43; residence, Chicago; occupation, mechanical engineer and solicitor of patents.

Q. 2. What experience have you had, if any, as an expert in the examination of patents and patentable devices, and in instituting comparisons between different mechanical devices, and in drawing conclusions with reference to their points of difference and resemblance? State fully.

A. 2. Possessing decidedly mechanical tastes, I received in early life a thorough, theoretical, and practical and mechanical training, and engaged in mechanical pursuits. For the past eight years I have devoted myself more or less continuously to mechanical matters, including the investigation of patents, soliciting of patents, and the preparation of drawings and specifications for novel mechanical constructions, and for the last three years I have devoted myself exclusively to soliciting patents, and acting as a professional mechanical expert in patent cases, during which time I have on numerous occasions given testimony to be used before the United States courts, relating to patents, patentable devices, and mechanics generally.

Q. 3. Have you read the several exhibits, to wit, the plaintiffs' patent at issue, dated March 31, 1868, reissue No. 2909; Eberly patent, dated December 22d, 1857, No. 18894; Rowell patent, reissue, dated April 13th, 1869, No. 3373; Haverstick patent, dated April 2d, 1850, No. 7241; Fowler & Bacon patent, dated March 28th, 1865, No. 47008; Atwood patent, dated April 24th, 1866, No. 54089;
Whiting & Mapes patent, dated December 26th, 1865, No.
49 51768; Francisco patent, dated March 7th, 1865, No. 46654;
J. H. & J. W. Thomas patent, dated June 13th, 1874, No. 152,706, with their several accompanying drawings and specifications, and have you examined the several devices referred to in said patents? If yea, do you understand the construction and mode of operation of such devices described in such patents?

A. 3. I have made an examination of said letters patent, and of the model devices representing the construction therein described, so far as they are present in this room. I fail to see anything representing the Haverstick construction here. I think I am familiar with the mode of construction and operation of the several devices.

Q. 4. Will you institute a comparison of these several exhibits just referred to, and the several devices therein mentioned, with the plaintiffs' patent, drawings, and specifications, and the devices therein mentioned, and state how these several devices referred to, and the devices described in the plaintiffs' patent, drawings, and specifications, agree, and how differ in mode of operation and construction; and also how the defendants' device, described in the defendants' patent, drawings, and specifications, agrees with, and how differs from the plaintiffs' devices described in his patent, drawings, and specifications, and whether or not, in your opinion, these several exhibits and devices are or are not substantially different devices, stating fully, and giving your reasons therefor.

Counsel for the defendants object to the question, because it is not in rebuttal. As he understands the equity rules complainant cannot attempt to prove infringement in rebutting testimony. He will, therefore, move the court to have all comparisons between plaintiffs' and defendants' devices stricken out of the so-called rebutting testimony.

A. 4. This question, I understand, to call for a review of each and every patent mentioned in the previous question, and of each and every model exhibit presented in the case, as representing the constructions described in said patents. I take them up in the order in which they have been named.

First, complainants' patent exhibit, patent to J. S. Rowell and Ira Rowell, reissue No. 2909, March 31st, 1868.

I find described in said patent an invention relating to seeders, which, by the terms of the claim, consists in combining all the following elements, namely: A slotted beam, a plow tooth, a brace bar or arm attached thereto, and a clamping bolt.

I have heretofore made and examined several patents and model exhibits which are understood to represent the history of the art to which this Rowell patent pertains. I fail to find in any patent of date prior to that of the Rowell patent, anything whatever corresponding in construction or function with the slotted beam of Rowell, as used by him in combination with other parts named, for
50 the yielding support of the plow tooth. The slotted beam, therefore, I regard as the distinctive and novel element of Rowell's claim. In the Eberly patent, the plow exhibit present, I find a tooth, or shovel so supported in position that it will yield undoubtedly, as alleged by the patentee in his specifications, when it encounters extraordinary resistence in operation. But this patent does not describe, nor does the model exhibit show, a slotted beam, or anything corresponding thereto in construction, or in the peculiar action which, in my judgment, attends the slotted beam, as employed by Rowell. This leads me to say that I regard the Rowell slotted

beam as a clamping device, or rather as the jaws of a clamping device in combination with an armed tooth, as being not only simpler in original construction, cheaper in cost, less liable to accident, and therefore less liable to get out of repair, but also distinctive in its action, as a clamp holding yieldingly a flat iron shovel standard.

First, I observe the clamping jaws thus constituted are wholly of wood. They operate as springs, to automatically release themselves from pressure upon the shovel standard when not subjected to the action of the clamping bolt; being brought up into contact with the shovel standard uniformly, and by reason of their texture as being of wood, they conform readily to the inequalities of surface upon the standard. In the first instance, and under the extraordinary strain to which it is desirable the clamp shall yield, the ready conformity of the wooden surface permits the unequal surface standard to slide between the compressed jaws of the clamp. Consequently in a clamp constituted of wooden jaws, held by a clamping bolt, there is obtained a determinateness, uniformity, and reliability of action peculiar to itself, as distinguished from a clamp, one or both of whose jaws are of iron.

In the Eberly patent I find the clamping device as above stated as not being formed of a slotted beam. There is no function of a spring therein, and only one of the surfaces between which the part clamped is held is of wood, the other is of iron, being the nut of the bolt which passes through the plow beam. In such a clamping device will not be found that determinateness, uniformity, and reliability of action which characterizes Rowell's clamping beam, because, as is well known in mechanics, the action of iron upon iron when compressed together, except when especially provided to the contrary, is to hold the two parts thus compressed firmly in position. In this instance I find no special provision whatever to secure the free movement of the clamped part beneath the iron which holds it. Both are rough; the clamping part is not uniform in thickness, and to secure a proper yielding of the shovel under extra strain, no adequate provision is made. I do not find therefore that said Eberly patent contains the elements of complainants' patent, in that it does not contain the slotted beam, or any substance equivalent thereto.

In the Haverstick patent the slotted beam is absent. There is no extension of the tooth standard that corresponds with the so-called brace "C" in Rowell's patent; and generally the device shown
51 by Haverstick is wholly different in the principles of construction and operation from that of the Rowell patent. The clamping device is wholly distinct from the beam, is not of wood, and depends upon the yielding action of springs to release the tooth. It has none of the advantages of cheapness and simplicity of construction, and is far more liable to get out of repair or become worthless in use. It seems to be the first instance in the art, as here shown, of a so-called slip tooth. Between it and the complainants' patent exists those differences which characterize generally the progress of improvement and invention in the development

and reduction to simple practical form of valuable ide as in mechanical devices.

In Fowler and Bacon's patent I also find a slip tooth held yieldingly by a peculiar device applied to the plow beam, consisting of cast-iron jaws, which, however, do not clamp, but against the quadrant-shaped edges of which the tooth is drawn by means of a tapering pin thrust through the jaws and the upper end of the tooth standard; the construction is wholly different from that shown in complainants' patent, in that there is an absence therein of the slotted beam, the armed shovel standard, and the clamping bolt applied to hold the standard by means of such arm within the slot. In other words, in my judgment, it fails wholly to anticipate complainants' patent, by reason of these essential differences in construction and operation.

In Whiting & Mapes, the upper end of the tooth standard passes through a mortise in the beam, and is held at any desirable point to give the required inclination to the tooth by means of a horizontal eccentric or cammed binding device which is made to bear against the side of the standard. As the patentees say nothing of its yielding to extraordinary pressure, and as this device is one calculated or suited to set the tooth with absolute rigidity against any opposing strain it is likely to meet with, I am unable to say that this is a yielding tooth at all, so far as held by this fastening. The tooth standard is composed of two sections, overlapping each other below the beam; the lower section is centrally pivoted, and may spring back freely at its top, but cannot spring forward at its top as it would be required to do when the shovel encounters an obstruction. There is nothing therefore in the construction and operation of this device, as explained by the patentee, and as shown in the patent, which implies that there is any intention or possibility of such an operation of slipping as was contemplated by other patentees mentioned, and as contemplated by the complainants in their patent. I can conceive that the fastening might possibly be made to have a slipping movement, but if that were done said Whiting & Mapes' device would not show the characteristics of construction and operation which I have pointed out as belonging to the Rowell patent, and does not therefore in my judgment anticipate the same. I will add that there is no model present of this Whiting & Mapes' device.

In the Atwood patent I find a plow standard pivoted to a beam, an arm pivotically secured to the foot of the standard, a heavy
52 cast-iron eye, secured to the end of the beam, through which eye the arm or brace passes; and I find a stout set screw running into the eye from one side to secure the arm in place. I find on reading the specifications that Atwood indicates no purpose analogous to that which is present in Rowell's patent, namely: The yielding of the plow when it strikes an extraordinary resistence in the ground. He describes his device as being intended to secure adjustment of the plow as to its angle with the beam, in order to vary the depth of the furrow. He accomplishes this adjustment by loosening the set screw, tilting the beam backward or forward, by which

the arm is drawn or pushed through the eye, and when the proper adjustment is made, the parts are secured permanently in that position by setting the set screw firmly up against the brace. In general, this is such a device as is mechanically adapted wholly to perfectly secure the parts firmly in their relative positions. The iron faces in contact, that is, the inner wall of the eye, and side of the adjusting bar, are broadly in contact; the set screw on the opposite side of the bar, to hold at all, will need to be run up so as to sink, as all set screws do in a measure, in the surface of the bar. In the absence of any statement of a purpose to secure a slipping movement in the specifications of the Atwood patent; in the presence of a statement that the parts are to be firmly secured; in the presence of a device embodied in the model exhibit here shown, wholly adapted to firmly secure the brace, it is my judgment that Atwood never intended to obtain a slipping movement to his tooth in the operation of the plow. As proof going to show the adequacy of this device to uphold the plow against a powerful resistence, I call attention to the evident fact that the heavy casting on which the eye is formed has been broken. It must have been broken, in my judgment, in the act of plowing, and when it struck some powerful resistence. The model has been mended to hold the piece containing the eye pretty nearly in its original position. I don't know as I ought to say that I believe this piece to have been broken in the act of plowing, as it may possibly have been broken otherwise. It is, however, in my opinion broken exactly at the point at which it would break when subjected to a sudden upward strain applied in the direction of the brace bar. This Atwood device does not possess the slotted beam of Rowell, and consequently does not possess what I regard as the distinctive element of Rowell's invention. It cannot therefore contain his combination.

In the Francisco patent I find a mortised beam, and within the mortise a pivoted shovel standard. The shovel standard is of peculiar form, that is to say, has an eccentric or cam at its upper end, and thus acts in combination with the slide fastened yieldingly in front of the standard, upon the top of the beam. The slot in the beam is not compressed by any clamping bolt, and does not therefore act like the device shown and claimed by Rowell. The elements of Rowell's invention, in short, are not present in the Francisco patent, and it does not therefore anticipate Rowell's invention.

53 In the Rowell reissue of 1869, being a reissue of patent of 1862, I believe, there is shown a slip tooth which belongs to the older art represented by Atwood, Eberly, Whiting, and Mapes, etc., and which differs, in my judgment, essentially from the Rowell invention shown in patent of 1866, reissued in 1868, being the patent sued on in this case, in that, as already explained of the others, it does not contain the distinctively new element of the slotted beam in combination with an armed tooth and a clamping bolt operating to hold said armed tooth yieldingly within the slot. It therefore does not, in my judgment, anticipate the patent sued on.

Taking up now the defendants' patent and model exhibit, I find

the same to contain all the elements of the Rowell patent without exception. I find them constructed and arranged to operate substantially for the same purpose, and in the same manner. In other words, I find, first, the slotted beam; second, the shovel shank; third, a brace bar or arm; finally, a clamping bolt; said shank being in both cases similarly pivoted loosely within the slot, and similarly clamped by means of a clamping bolt. In short, as before stated, the same parts are present, constructed and arranged to operate to all intents as and for the purpose specified by Rowell.

As I learn from the evidence, and the counsel in this case, it is not claimed by the defense that the defendant has not the slotted beam, or the pivoted shovel shank, or the clamping bolt, but it is denied by the defendant, as I understand and am informed, that they have the brace bar "C," of Rowell, or its equivalent. To my mind there is on the face of their exhibit and patent no question whatever upon this point; they obviously have the substantial equivalent of Rowell's brace bar C. But in order to make my view more plain I have caused to be prepared a series of small models, which I now offer as a part of my evidence, and ask that they be numbered in the order in which they are handed to the examiner, preparatory to my comments thereon. Said models are marked respectively Dayton's Model No. 1, No. 2, No. 3, No. 4, No. 5. In the first place I have been led to inquire, What is a brace? The word is derived from a Latin word, meaning an arm. When an arm is extended from the part to which it is attached against a second part, the two parts being joined, or meeting at an angle, the arm which before had no function, now operates technically as a brace. The word "brace" therefore has reference to the functions of an arm. That function is to furnish support between the parts which it connects. All doubt as to the perfect correspondence in principle of operation and mode of construction between complainants' and defendants' devices in my mind wholly disappears when I use the word "arm" at all, instead of the word "brace." For there is unquestionably at the top of the plow standard in defendants' patent and model exhibit, an arm extending from said standard, lying within the slot, at a point somewhat distinct from the center of motion of the standard; and there is a clamping bolt which compresses the jaws formed by the slot upon such arm. It is in my judgment immaterial at which end of the arm the standard is joined, or at which end of the arm the clamping bolt is applied. Thus, by reference to defendants' device, the transposition of the clamping and pivoting bolts would not alter materially the operation of the tooth. I mean that if the pivotal bolt was inserted through the top of the standard proper, and the clamping bolt were placed near the end of the curved arm, such a change would not, in my judgment, affect the operation, or principle, or construction of said device. In both cases equally would the clamping bolt operate upon the arm rigidly secured to the standard at a sufficient distance from the pivotal point to give the required leverage to sustain the standard firmly for all legitimate purposes, and so as to yield when exposed to extraordinary strain. Such a modification would also, in my judgment, be such as any

54

ordinary mechanic might readily make without invention. Now, lest these considerations fail to make plain the identity between plaintiffs' and defendants' devices, I refer to the models marked Dayton's models No. 1, No. 2, No. 3, No. 4, and No. 5.

In model No. 1 is shown what may be understood to be a plow shovel, with a standard having a broadened or web-shaped top rising in a curve above the beam. This is set within a slot of the beam, and pivoted thereto at a point near the forward edge of the web or broadened top of the standard. Said web or broadened standard top is clamped within the slot by a clamping bolt passing through the wooden jaws at the rear of the web.

Model No. 2 does not differ from model No. 1, except that a portion of the metal in the center of the web is cut out as being useless. The clamping bolt may, in this case, be applied obviously either outside the web or the broadened top of the standard, or through the hole cut in said standard. The cutting of such hole to reduce the weight of metal gives us a loop. There is obviously no difference between models No. 1 and 2 in the essential mode of construction and operation.

In model No. 3 the top of the loop is cut away as being useless. That is the only change made. The size, form, and direction of the parts remaining in No. 3 correspond, so far as they go, wholly with the same parts in model No. 2. There is, consequently, no modification yet made in the essential principle of construction or operation of the tooth.

In model No. 4, instead of cutting away the top of the loop of model No. 2, the lower rear portion of said loop is cut away, leaving what may be called a curved arm above the pivotal point of the standard, reaching over backward within the slot of the beam, and being clamped wholly in the same manner as in the case of either and all of the preceding models.

In model No. 5, instead of cutting away the top of the loop, as in model No. 3, or the rear lower portion of the loop, as in model No. 4, I have retained these two parts and cut away the lower front portion of the loop. It is the same tooth in form, dimensions, mode of application to the beam, mode of operation in combination with the pivotal point and the clamping bolt as either and as all of the preceding models.

55 Now, model No. 3 is the specific form of the loop which Rowell shows in his patent, and is shown in the model exhibit representing that invention. Model No. 5 is the specific form of the originally same loop which the defendants show in their device. To my mind, these models are conclusive demonstrations of the perfect identity, in all that relates to their essential modes of construction and principle of operation, between the complainants' and defendants' devices; for, mathematically, two things that are equal to a third are equal to each other. In all these models we have the slotted beam, pivoted standard, the brace bar or arm, or support, whichever it may be called, whereby the standard is held frictionally through the operation of the clamping bolt within the slot.

I therefore find in the defendants' patent, and in his model exhibit, representing the device shown and described in said patent, each and every element of the complainants' claim, namely, the slotted beam "A," shank "B," the brace-bar "C," and bolt "D," constructed and arranged to operate as and for the purposes therein specified.

(Complainants' counsel shows witness exhibit marked "Dividers," and exhibit marked "Bevel-square.")

Q. State whether or not you find in these two exhibits any of the elements of the plaintiffs' device and invention; and if so, what are the points of resemblance and difference? State fully.

A. I do not recognize in the dividers any seeder, shovel, or drag-bar. I recognize only certain elements or parts which Rowells do not claim in their patent, otherwise than in combination with the shovel standard and beam. The two arms of the dividers are held fixedly at any angle of expansion by means of a curved or quadrant-shaped arm secured to one of the standards and passed through a slot or mortise in the other. The second arm of the dividers is provided with a set screw, which works against the quadrant within the slot and holds it fixedly in place. This bears the same relation to the Rowell invention that the so-called mechanical powers (which are in fact the elemental means known in mechanics as applied to solids) bear to the great multitude of inventions known to us. There is no community of purpose any more than community of combination of elements between the dividers and the Rowell seeder. The same is true of the bevel-square in general. It is a very old and familiar device to me—probably older than I am in the art to which it belongs. The wooden body of the bevel-square is slotted at one end deeply; the blade is slotted longitudinally and centrally, and inserted within the end of the slot in the body. The clamping screw passes through the parts and holds the blade more or less fixedly at any desired angle with the main portion of the implement. As before stated of the dividers, there is no similarity of purpose or function between this as a whole and the Rowell seeder.

Witness shown the exhibit marked "Defendants' Modified Tooth and Beam," and exhibit marked "Defendants' T-headed Tooth," and the exhibit marked "Eberly Tooth and Beam," exhibit marked "Modified Eberly No. 2."

56 Q. Will you make a comparison between these exhibits just referred to and shown you, and state how they agree with or differ from the plaintiffs' exhibit marked "Plaintiffs' Tooth and Beam," and give your reasons therefor.

A. The exhibit defendants' modified tooth and beam exactly represents the modification which I have supposed in a previous answer, and as there stated this modification is not one that goes to the principle of construction or mode of operation in any degree whatever. It is such a modification as any ordinary mechanic might, with reason, or without reason, be led to make. Also, as previously stated,

it does not in my judgment differ in any essential respect from the Rowell exhibit with which the comparison is asked to be made.

The exhibit "defendants 'T'-headed tooth" embodies the same principles of construction and operation precisely as the Rowell patent set forth, and the Rowell model exhibit shows.

Relative to the exhibit "Eberly tooth and beam" and the "Eberly modified tooth and beam No. 2" they in my judgment both differ essentially in principles of construction from the organism specially claimed by Rowell, in the total absence therein—that is, in the Eberly exhibits—of the slotted beam, constituting a clamp, within which clamp the shovel standard is yieldingly held by a clamping bolt. In operation they will have the intermediate, ununiform and unreliable action, which belongs essentially to a clamping device for yieldingly holding a bar of iron, constituted partly of wood, and partly of iron. They do not therefore in my judgment contain the invention set forth and claimed in the Rowell patent which is specific for the slotted beam, the shovel shank, the brace bar or arm, and the clamping bolt constructed and arranged to operate as and for the purpose specified by Mr. Rowell.

Q. State whether or not in your opinion a set screw is equivalent to a clamping bolt when used in connection with the slip tooth, giving your reasons *pro* and *con*.

A. A set screw might be applied to a slip tooth, but in order to secure a determined and reliable slipping action, a set screw would not be brought to bear directly upon any arm or projection of the tooth, but there would be interposed a third part, corresponding to what is known as a gib in machinery, which is always, I believe, inserted between the set screw and a slipping part, when a set screw is employed.

To answer the question more distinctly after hearing it reread, I will state that a clamping bolt may be applied to obtain the same defects in operation that characterize the set screw bearing directly upon the part intended to move. When either is applied to hold a part movably, in good mechanics, either the set screw, or clamping bolt will be made to act mediately. Thus in the Rowell patent and model exhibit, the clamping bolt acts mediately through
57 the jaws, the wooden jaws formed by the slotted beam. The jaws, and not the clamping bolt, are in contact with the part intended to move.

(Witness shown exhibit marked "Defendants' Tooth and Beam.")

Q. State whether or not in your opinion, if the shank or the tooth in this exhibit should bend in practical operation, it would constitute any essential difference on that account from the plaintiffs' device; whether or not it would be an element of invention, giving your reasons.

A. Certainly not. I should say it was the result of defective mechanical judgment in the construction or application of the tooth. In other words, I should say, having reference to a—the use of a given amount of metal in the tooth, the mechanic might better have

chosen some other one of the several forms of construction illustrated by the series of Dayton models already presented.

Q. State whether or not in your opinion there is any essential difference in the operations of the defendants' tooth, as compared with the plaintiffs' tooth, when it meets an obstruction in passing backward, upward through the slotted beam, and give us your reasons therefor.

A. To my mind it is perfectly obvious that there is no essential difference in the operation, so obvious that it becomes difficult to furnish a reason. It is like attempting to prove an axiom in mathematics.

Q. State whether, in your opinion, this strain imparted to the two teeth, to wit, the plaintiffs' and the defendants' when meeting with an obstruction in practical operation in the field, is the same.

(Question objected to.)

WITNESS: Do I understand the question to refer to the amount of of strain, direction of strain, or quality of the strain?

COUNSEL: To the manner of the strain. I might amend the question. Is the manner of the strain imparted to the tooth the same?

A. The strain is in both instances backward upon the tooth. In my judgment the form and position of the bracing arm is better calculated in complainants' exhibit to sustain the tooth against such backward strain than the defendants' exhibit, enabling him probably to use a lighter tooth to meet a given strain.

Q. State whether or not in your opinion, with the specifications and drawings accompanying the complainants' letters patent, a mechanic of ordinary skill could construct the device, to wit, the tooth and beam of the defendants.

(Objected to, as not in rebuttal.)

A. I think he could, but I don't think a good mechanic would do it.

Q. Why not?

A. For reason that it is not so sensible a form of tooth to secure the support required, having reference to the body of metal
58 to be used; that is to say, I don't think he would do it if he were free to make any construction that his judgment approved under the patent.

Cross-examination:

Defendants' counsel declines to cross-examine the witness in reference to the questions of similarity and difference between plaintiffs' and defendants' devices, reserving the right to exclude the same.

Q. In your opinion, if the Whiting and Mapes patent used the slotted beam and through bolt to hold its teeth in position, instead of the device there shown, would the pivotal character of the tooth to the brace still render it an essential departure from the patent of complainants?

A. I think it would differ from the invention as specifically claimed

by the complainants. It is one of the features of his construction that the arm is a lateral projection from the shovel standard, rigid therewith, and thereby adapted to hold the standard rigid with the beam when said arm is clamped. Such a supposed construction would not be in my judgment a combination of slotted beam, shank, and brace-bar or arm, and clamping bolt constructed and arranged to operate as and for the purposes specified by Messrs. Rowell.

Q. And the same would be true of the Atwood patent—having a pivotal arm or brace, instead of a rigid one, makes it essentially a different device in your opinion, does it?

A. Under these very specific terms of the claim, I am inclined to think it would, for the reason that with a pivoted arm a narrow slot or mortise is sufficient to allow of an upward movement of the arm through the same, while with the rigid attached arm of Rowell's an elongated slot is necessary, unless the arm be accurately curved from the center of motion of the standard, which is not the case, either in his patent or in the model exhibit.

Q. Name some instances of the use of the gib between the set-screw and the object held in common use, if you know any?

A. In steam-engines it is very familiar in connection with the reciprocating cross-head. In the stamping-press, in connection with the vertically-reciprocating cross-head which holds the stamp, and numerous other cases.

Q. In these instances is the gib made of metal or wood?

A. It is made of metal, very accurately finished, as is also the cross-head, so that the opposite surfaces of the cross-head are perfectly parallel and smooth, and the gibs lie in perfectly parallel plains, or if not entirely parallel plains, adapted to fit upon a cross-head where the sides are parallel.

Q. Now, if there were a washer introduced between the head of the bolt and the slotted brace of the Eberly patent, the part
59 being accurately finished, would it or not in your opinion then become an equivalent for the slotted beam of complainants' patent?

A. It would not wholly. The slotted beam of complainants' patent has this distinctive characteristic—that a single indispensable part of his machine, namely, the beam, by simply slotting it, is transformed into something more than a beam. It is now made a clamp by the aid of a small clamping-bolt, without the addition of any new part, the expense and trouble of attaching it to another; and it is a desirable feature that it is also a spring-clamp adapted to automatically open as the bolt is released, or as the nut is run back from the bolt, so that, without trouble, the tooth may be shifted by the hand, or by a kick from the foot and readily restored to its original or desired position.

Q. Then, if this slotted beam were made of metal, say first-class iron reduced to proper proportions, it would be the equivalent for the slotted beam in Rowell's patent, would it?

A. Not wholly, for the reason that in order to adapt a slotted metal beam for use in the same relation, and to secure the determinate, uniform and reliable slip of the tooth, it would be necessary to care-

fully prepare both the inner surface of the jaw and the outer surfaces of the tooth or arm; and even when thus prepared I do not believe that it would have the desired holding and yielding qualities that belong to the wood by reason of its yielding fibrous structure.

Q. In your opinion is it possible to so tightly secure the clamping-bolt in the Rowell patent that it will not readily yield to obstructions?

A. Unquestionably it may be secured to any desirable degree of tightness. What I mean to be understood is this—that having in view the irregular surfaces of the forged bar, or shovel standard, a given impression of the jaws thereupon by means of the clamping-bolt, will give to-day, to-morrow, and next week a substantially uniform resisting power to the friction of such clamp. That this would not be the case with the iron clamp, unless made with the utmost care, and nicest measure of power applied to the clamp in order to secure anything like a uniform resisting effect. While in the case of a wooden clamp, a man in the field with a hand-wrench would to all intents and purposes be able to secure a uniform resistance from the clamp.

Q. If the inner sides of both jaws opposite the brace of the Rowell slotted beam were lined with common thin bar iron, in your opinion would or would not such lining of the jaws with iron practically interfere with this uniformity of clamping which you have spoken of?

A. I think it would.

Q. And in your opinion it would be practically a different device?

A. Not necessarily. That does not follow. A man by adding an element to a structure, the only object or effect of which element can be to make it less efficient in operation, does not thereby make another invention, or avoid the original.

Q. Then you still think it would practically be the same device with reference to those features which constitute invention?

A. It would be a defective device with reference to those features wherein lack of mechanical judgment would operate to make it defective.

Q. My question was, practically, and I mean in the hands of the farmer, would it perform the practical operations required by the Rowell patent, or would it not?

A. So far as refers to the determinateness, reliability, and uniformity of action, I think it would be a defective construction of Rowell's invention.

Q. And yet it would contain the Rowell invention substantially, differing only in degree?

A. So far as relates to patented features of Rowell's invention it would contain them, made defective by the exercise of poor judgment.

Q. The difference would be of degree, and not of kind, in your opinion?

A. Of degree, affecting the operation, not at all of kind, as affecting invention.

Q. So, then, this practical fixedness or determinateness of clamp-

ing may be changed in a great degree without departing from the character of the invention, can it not?

A. If that result is wrought out through the medium of Rowell's invention, it is precisely the parallel of a great many cases in which an invention is rendered valueless by bad mechanical manipulation. In other words, any man can take Rowell's invention, as they may take anybody else's invention, and ignoring its spirit and purpose and scope, may introduce features that would not, in my judgment, release him from the charge of infringement, while they would render the invention valueless in his hands.

Q. My question was—the determinateness or uniformity of the fractional grasp of the Rowell patent can be verified to a great degree, in your opinion, without departing from the character of his invention. Is that true?

A. Yes, sir; because Rowell's invention does not consist wholly in the quality or degree of the fractional grasp.

Q. What experience have you had in the manufacture and use of slip teeth, such as you have been testifying to?

A. None whatever.

MELVILLE E. DAYTON.

J. S. ROWELL, recalled (in rebuttal):

Q. State what manufacturers use the slotted beam or the slipping cultivator tooth.

A. Mast; Appleton Manufacturing Co.; Depere Agricultural Works, Depere, Wisconsin; Van Brunt & Barber, Horicon,
61 Wisconsin, have used them, but I don't know as they are using them now. They used them up, I think, until last year. I think they are using some of them now. Van Brunt & Davis, Horicon, use them; Thomas, Ludlow & Rogers, Springfield, Fond du Lac Wheel and Seeder Co., have been up until, I think, last year.

(By consent defendants have leave to present McSherry & Hoosier drill. The plaintiffs have the right to present any others named.)

Q. State whether or not you can align your slip tooth in the slotted draw-bar; and, if so, how?

A. We do align. We do it by raising the brace half an inch or so, or an inch above the top of the beam.

Q. State whether or not your slotted beam device of the plaintiff has or has not paved the way as far as you know for slipping cultivator teeth.

A. It has been the first slotted beam used for slipping cultivator teeth; the others have followed it, not of those (pointing out certain ones)—not for all referred to, where they are slotted out at the rear end.

Q. State whether or not the plaintiffs' slotted beam has or has not displaced other devices for holding cultivator teeth.

A. It has.

Q. State whether or not the plaintiffs' device, slotted bar and

tooth, is not cheaper and better than the old device, which is displaced.

(Objected to.)

A. Better than any I ever had anything to do with.

Q. State when and where you first made and put in practical operation the plaintiffs' device marked "Plaintiffs' Tooth and Beam." State fully.

A. To the best of my recollection, in fact I know it was the very last days of the year 1864, or the first days of the year 1865. I built one tooth like this. (Referring to plaintiffs' model No. 3.) And in January and February, 1865, I built sixty machines and delivered them in those months, and in the first of March, 60 of those machines with that tooth.

Q. To whom did you sell and deliver such teeth, and for what purpose?

A. I can't really remember to whom, except one I know of, that was to my brother.

Q. And for what purpose?

A. For putting in his wheat.

Q. How did he take that home? Do you remember?

A. We were looking it over the other day. We found he took it home on a sleigh, and the most of those machines were delivered on sleighs.

Q. Were they put to actual use?

A. To actual use as soon as the frost would admit of their being used. As a general thing these teeth are used before the frost
62 is fairly out of the ground in our spring wheat, when it goes down from four to five inches, so they commence to sow their spring wheat.

Q. State whether or not all the patentees of the several devices referred to in the evidence of the defendant have had or used the old tooth containing the slotted beam before the date of their patent; if so, what ones? State fully.

A. The Appleton Manufacturing Co. used it. J. H. Thomas, firm of Thomas & Mast, he is not in the firm, but he is one of the patentees of this tooth; the getters up of this machine used it, the Depere.

Q. Did Francisco have your machine before the date of his patent?

A. No.

Q. Fowler & Bacon?

A. No, sir.

Q. Whiting & Mapes?

A. No.

Admission: It is admitted by the defendant that the form of the tooth in the Rowell reissue of patent, 1869, is the same as the original patent, 1862, so far as the form of the tooth is concerned. Exhibit marked certified copy David Eberly shovel plow, it being a Patent Office model of the same, offered in evidence by the complainants.

G. L. CHAPIN, sworn on behalf of complainants, testified:

Q. State your name, age, residence, and occupation.

A. G. L. Chapin; residence, Chicago, Illinois; age, about half a hundred; occupation, patent attorney.

Q. What experience have you had, if any, as an expert in the examination of patents and patentable devices, and in instituting and making comparisons between different mechanical devices, and in drawing conclusions with reference to their points of difference and resemblance? State fully.

A. I am a practical mechanic; have been engaged largely as an expert in patent cases for the first half of the last twenty years. I have been engaged in Chicago for nearly 15 years as patent attorney and solicitor of patents. During that time I have done almost exclusively an extensive business in procuring patents for the various machinery used in this country, and have examined mechanism, and compared the same with patents, and have been called upon continuously in my business to give an opinion in regard to the scope of patents and the working devices therein shown and claimed; and also as attorney brought a large number of suits for infringements, and also defend a large number of the same cases.

Q. Have you read the several exhibits, to wit, the plaintiffs' patent in issue, dated March 31st, 1868, reissue No. 2909; Eberly patent, dated December 22nd, 1857, No. 18894; Rowell patent, reissue dated
63 April 13th, 1869, No. 3373; Haverstick patent, dated April 2nd, 1850, No. 7241; Fowler & Bacon patent, dated March 28th, 1865, No. 47008; Atwood patent, dated April 24th, 1866, No. 64089; Whiting & Mapes patent, dated December 26th, 1865, No. 51768; Francisco patent, dated March 7th, 1865, No. 46654; J. H. & J. W. Thomas patent, dated June 13th, 1874, No. 152,706, with their several accompanying drawings and specifications; and have you examined the several devices referred to in said patents; if yea, do you understand the construction and mode of operation of such devices described in such patents?

A. I have examined the several letters patent and the devices therein shown, described, and claimed, so far as relates to the connection of the shovel or tooth shank with the draft-bar, and so far as these shanks may be yielding with reference to said bars; that is, so far as I am informed that it is necessary to meet the case at issue. I have also examined the several models, and understand them. I find that the Haverstick, Whiting & Mapes, and Francisco models are not present.

Q. Will you institute a comparison of these several exhibits just referred to, and the several devices therein mentioned, with the plaintiffs' patent, drawings, and specifications, and the devices therein mentioned, and state how these several devices referred to and the devices described in the plaintiffs' patent, drawings, and specifications agree, and how differ in mode of operation and construction; and also how the defendants' device described in the defendants' patent, drawings, and specifications agree with and how differ from the plaintiffs' devices described in his patent, drawings, and specifi-

cations; and whether or not, in your opinion, these several exhibits and devices are or are not substantially different devices; stating fully, and giving your reasons therefor?

A. The letters patent, dated March 31st, 1868, on which this suit, as I have been informed, is founded, consist, as is shown and described, of a wooden draw-bar or drag-bar, the rear portion of which is slotted out vertically and longitudinally; this slot being of a form that is termed in engineering an open mortise. The object of the drag-bar, as is well known to the art, is to draw the cultivator tooth or plow tooth forward to till or stir the soil.

(Counsel for the defendant objects to the question, because it is not in rebuttal. As he understands the equity rules, complainant cannot attempt to prove infringement in rebutting testimony. He will, therefore, move the court to have all comparisons between plaintiffs' and defendants' devices stricken out of the so-called rebutting testimony.)

The witness continues: The object of this vertical slot or open mortise is to raise the upper portion of the shank which supports the cultivator tooth or plow. One portion of the shank is pivoted to the draw-bar, that is, the forward portion, and the rear portion "C" is
64 made to have a longitudinal movement in the draw-bar, and both parts are placed in this slot, so that the clamping bolt put through the jaws or margins of this slot may be turned so as to press the jaws against the upper portion of this shank "C," and thus produce such pressure that friction, which is resistance to motion, would be sufficient to hold the shovel or plate in the proper position to till tillable soil, and yet not so tightly in position but that if the shovel should strike a substance which would otherwise break the shank of the shovel, or injure the movement, the shank would swing on the pivot, and the shovel would be thrown back out of the way without danger, in which out of the way position it could be easily replaced by being pressed upon by the foot, or other convenient means ready to the hand of the person who should operate this agricultural implement.

The inventor in these letters patent has sought to get a leverage some distance from the pivotal point, whereby the pressure of the clamping bolt may be not nearly so great as otherwise, so that by means of this leverage the shovel or plate is held to its work in the ground when it would not be with the same strength of material, provided that there were no arm or projection extended some little distance from this pivotal plate. In view of the art as represented by the several patents and models to which my attention has been called, I see that the device in this patent sued on has this distinct feature from the others, that is, the draft-bar, without any additional mechanism, except a pivot and a clamping bolt, is made to perform a two-fold function; that is, of a draft-bar and of a clamp which is very simple in construction, cheap of manufacture, easily operated, and very certain in its operation; and in my practical observation of these seeders for the last ten years, and in view of some experiments I made, and mechanical principles I am familiar with, I will

say that for cheapness, certainty of operation, uniformity of movement, that the ordinary wood of which these draft-bars are made is very much the best materia!, considering the cost, of any material of any bars of which I have any knowledge.

The principal feature of the invention in this patent I consider is the forming of the draft-bar, as stated, by slotting out its rear part, and the leverage given to the portion of the device by extending or enlarging the upper portion of the shank of the seeder tooth or plow, whereby a large amount of resisting force is attained with a comparatively light strain put upon the clamping screw. I see that the letters patent call for a slotted beam, a shank or brace, and a bolt. I would say, from the drawings it is readily seen the function that this alleged brace performs. It might just as well be called an arm, or an enlargement of the upper portion of the shank of the shovel; the object being to get the leverage at the proper distance from the pivotal point, and it don't make any difference in any respect, except as to the matter of cost of material, whether the space between the shank "B" and the brace "C" is filled up, provided there were any means to place the clamping pin through the jaws to get a proper pressure to attain the leverage to hold the shank in position for the shovel to perform its work in the soil.

The operation is as follows: If the shovel should strike or come in contact with a force that would otherwise injure the implement, the shovel would move back, and travel in the line of a circle, and what is termed the brace "C" would slide upwardly through the rear portion of the slot; but the brace "C" would not at any time be detached from the drag-bar. In this construction the principal portion of the shovel shank is pivoted to the draw-bar "A" at small "*b*", the clamping bolt is shown at "D." I notice there is only the four parts enumerated called for in the claim.

(Eberly Shovel Plow.)

I have had occasion to examine the Eberly shovel plow, patented Dec. 22, 1857, and at that time made several experiments to ascertain the extent that the shovels would yield backward when the plow was properly adjusted to till tillable soil. I gave expert testimony in reference to this patent in this circuit court district. I have not seen the evidence for about nine years, but I recollect of swearing positively at that time that when the shovel of this Eberly plow were properly adjusted to till tillable soil, that it was an absolute impossibility for those shovels to swing back far enough on their pivotal points to pass over ordinary obstructions in soil. And I state the same fact at the present time, with the knowledge that the patentee expected that these shovels would do that. It might have been in the head of the patentees, or his attorney, that he wanted to get up a plow whose shovels would perform that function, but neither of them ever got such a construction, either in fact or explained, in the specifications as would perform that function. This Eberly plow is quite liable to deceive a person of ordinary mechanical skill, for the shanks of that plow are pivoted to short arms projecting up from the draw-bar, and did not these shanks meet with some resisting

force to the contrary, certainly any ordinary obstruction in the soil, such as a root, stump, or stone, would turn these shovels back—they would project out behind like ducks' feet when such birds might be flying. But the shanks of these shovels are held by auxiliary draft-bar "G." The rear portion of these auxiliary bars are provided with triangular slots, through which the shanks of the shovel pass, and these shanks, in cross section, where they pass through the triangular slots or mortise in these auxiliary drag-bars, might be termed truncated triangles if extended to make complete triangles; their acute angles would be more acute on the forward edges of the shanks of the shovels than the mortises or slots in the auxiliary draft-bars through which the shank passes. The opposite ends or forward ends of these auxiliary draft-bars are provided with slots, and through these slots are placed bolts, and on the ends of these bolts are formed screw-threads, and thereon are turned nuts to clamp the forward ends of the auxiliary draft-bar "G" to the drag "B." Now, if nothing more be added to this construction, the plows, or shovels, would be inoperative, because their shanks do not fill the mortises or slots in the
66 auxiliary draft-bars, and they (the shanks) would have a slotted movement by the action of the earth on the shovels; and the shovels, being free to turn the dirt in either direction, would turn the eath to the row when it should turn from it, and turn the earth from the row when it should turn toit. To obviate this uncertainty, and to set these shovels so as to work in the direction required; that is, so as to throw the earth to the right or left of the said shovel standards, the inventor puts in wedges in the slots formed in the rear ends of the auxiliary draft-bar "G," with some little force, thereby making what is practically solid points where the draft-bar "G" embraces the shank of the shovels. Now as these auxiliary draf-bars "G" cannot swing, in consequence of having two fixed points, and inasmuch as these shanks must swing if they should go far enough to allow the shovel to pass over an obstruction, it is very evident to the mind of a very ordinary mechanic that notwithstanding you may loosen the nuts which hold the forward slotted ends of the auxiliary bars "G" to the main draft-bar, that the shovels nor shanks could be turned back not so much as the 16th of an inch, were it not for the spring of the material, or the imperfections in connecting the rear ends of the auxiliary drag-bar with the shanks of the shovel by means of the wedges spoken of. I have made sufficient experiments in this direction to be able to state that when these wedges are inserted as stated, that no force bearing backwards on this shovel could throw them back far enough to pass over ordinary obstructions without destroying some part of the construction. And when the adjustment is made as stated in the letters patent, so far as the shovel swinging back far enough to pass over an obstruction, the joints formed by the wedges, rear ends of the auxiliary drag-bars, and shanks of the shovel might just as well be made of solid iron. The statement in the patent is absolutely untrue, and there is nothing shown in the drawings to warrant any such statement in the specifications. I have examined the certified Patent-Office models of this plow, and find that the con-

struction is substantially the same as in the letters patent. The construction otherwise than this is very materially different from that mentioned in the letters patent on which this case is founded. The construction is that the shanks of the shovel, instead of operating in a vertical slot in the drag-bar, operate on arms, or verges, extending some little distance out from the main drag-bar, the very reverse, and really the farthest difference in that regard that an ordinary mechanic could conceive of. That is, I would say, as much difference as putting an ornament suitable for the inside of a house on the outside of the house; that no person, having the Eberly patent before him as a guide, would be warranted in throwing away the arms which support the shovel standards, and in lieu thereof put shovel standards in the draw-bar. In fact the specifications of the Eberly patent would prevent any such construction. The slots in the forward end of the auxiliary drag-bars will permit the shovels in the Eberly plow to be set at different angles, pro-
67 viding first the wedges holding the shovel shanks to the rear end of the auxiliary drag-bars be removed.

And after the adjustment is made, the wedge may be replaced, and the screw tightened on the slotted ends of those auxiliary drag-bars, and all the result would be, the plow would be set in a different angle from the draft-bar "B." As before stated, there is absolutely no slotted tooth mechanism or arrangement in the Eberly in any repect whatever whereby the movement of the tooth, as in the Rowell invention, is attained. There are other features widely differing from the letters patent on which this suit is founded, but they are too apparent to ordinary observers to need description.

I find a marked distinction in the Rowell and Lowth seeder and cultivator device, reissue dated April 13th, 1869, No. 3373, in the following particulars: These letters patent show a series of drag-bars attached to the grain seeding machine, and also show a slip-tooth, which requires the following parts and pieces of mechanism to give to the tooth this function: first, a drag-bar carried forward by an attachment to the seeding machine, seeder shovel pivoted to the drag-bar, so as to have a partial revolution beneath the drag-bar in vertical plain, and a friction brace which is slotted out at its lower rear end to embrace the shank of the seeder shovel through the jaws of the clamp "M," and forward of the shank of the shovel is placed a set screw whereby the jaws are made to embrace the shank of the shovel so tightly as to hold the shovel in position to till tillable soil, and yet not so tightly but that if the shovel should strike an obstruction which would otherwise injure the seeding machine, the shank would swing back outward and free itself from the jaws of the friction brace, and consequently pass over the obstruction without damage to the parts, perhaps as safely as the device will in the patent on which this suit is founded. I think I ought to say the same general result would be attained, but the means are widely different. In the patent sued on the drag-bar is made to perform the function of both the drag-bar and the friction brace in the patent No. 3373, whereby a more certain friction bearing is attained to hold the shovel shank to work, a more uniformity

of movement and a greater certainty of holding the shovel to its work with about the same force. I wish to state here, that in order for these machines to operate easily on a team that they ought not to be held or clamped so tightly as to produce a sudden jerk upon the harness or other tackling with which the team is connected to the seeder, but if they are properly set the team will move along with little interruption or irritation, even on quite rough ground. If these shanks "K" and shovels "J" were held quite strong they might slip out of the friction brace or clamp "M" before they would break, and yet the machine might be as a whole so rigidly in position that it would be practically inoperative on account of the constant jerking upon the team.

I understand the device in this patent No. 3373 to have been very superior in its day, and to have performed very useful purposes,
68 but from seeing the same in the field, and knowing the difficulty of clamping a very narrow piece of iron of the shank of the shovel so as to hold the shank in such a manner that about the same force would relieve it from the friction-brace, I am forced to conclude that the devices in the patent sued on are very superior in their uniform operation to those in this reissued patent, are certainly very much cheaper, simpler, and every way better adapted for the purposes; and that the invention in said patent sued on is a long step in the art toward improving this useful implement. There is another point of difference in the convenience of manipulating the devices in the patent sued on, consisting in the fact that when the shovel is thrown back from an obstacle which would injure the machine were not the tooth permitted to occupy a rear extended position, that the tooth so thrown back in the patent sued on is not thrown out from its friction-clamp; hence, a push from the foot would replace it again, because it would be all the time in this operating slot. This would not be the case always with the device and patent No. 3373, because the shank would be entirely thrown out from its friction-clamp, and it might be pushed with the foot a good many times; unless the foot was guided accurately by the eye, the shank might go either side of the slot in the friction-brace "M" before it would be made to enter the slot, and if the shank were not placed back quite soon after passing an obstruction, there would be quit a little strip of ground remain untilled, while the machinery would have to be stopped to insert a shank; the invention claimed and set forth in the patent on which this suit is founded, in my judgment, carefully formed from reading the two instruments, is not the same as reissue No. 3373, and that there is invention and utility in the devices in the patent sued on which are very marked and distinct from those set forth in said reissue.

The Haverstick seed-drill, as the device shown, is a construction designed to admit of a cultivator tooth swinging back from an obstacle which would injure the machine were such tooth rigidly fixed to the drag-bar; but the device to which I now refer differs essentially from the patent sued on, in the fact that there is no slotted drag-bar, and there being no slotted drag-bar, there is no drag-bar which performs the double function of carrying the tooth forward,

and clamping the tooth in a vertical slot so as to till tillable soil, and so as to swing back should the tooth or shovel meet with an obstruction. The means used in the Haverstick letters patent consists of a spring lock, the force of the spring of which, when operating on the lock, is to press upwards against the pivot which holds the hollow shovel-shank to the drag-bar. In this respect the spring is a unity, is a sole, while all the patent devices in the patent sued on is a community of two parts acting with equal force to attain a given result. Inasmuch, therefore, as there is no drag-bar in this Haverstick patent, having incorporated within itself clamping jaws, independent of any other mechanism, it is found that the device shown and claimed in said patent sued on is not shown nor claimed nor mentioned in the Haverstick patent. A skilled mechanic,
69 having the Haverstick patent before him as a guide, could certainly have no conception of making a device described in the claim in reissue No. 2909, dated March 31st, 1868. I will state, however, that the same end is sought to be attained, so far as passing over obstruction without breaking the implement is concerned; so far as the functions sought, the inventors may have aimed at the same end, but the means used are certainly radically different.

The device shown in the Fowler and Bacon cultivator teeth, patent No. 47208, was a very wide departure in the state of the art at the date of its conception, and while the arrangement with reference to the tooth exhibits some considerable ingenuity, yet the device is such that it comes in that class of constructions which may be true enough theoretically, but practically wholly inoperative, unless there was such a nicety of workmanship and fineness of adjustment which would make the device far too expensive for common practical use. The movement of the tooth, as sought to be made, could not be attained. Messrs. Fowler and Bacon sought to attain the same movement that Rowell and Lowth did in their patent reissued in 1869, and the means used is certainly a curiosity in mechanics, and such means certainly would not be employed by persons of any great knowledge in utilizing mechanical powers. They attach a segment or quadrant to the under side of the drag-bar, which segment is provided with a vertical slot formed longitudinally with the drag-bar. They form the shank supporting the shovel with a tongue at its upper end, and this tongue terminates in shoulders projecting outward on either side of the surface of the tongue, and they pivot the upper end of this tongue to the forward upper portion of this segment or quadrant by a tapering pin, which they intend, by driving it lightly through the segment and through the tongue, to draw the shoulders (small h) up against the lower edges of the slotted segment or quadrant, to produce such friction between the jaws 2 and the shoulders H as would be necessary to hold the shank C in position to till tillable soil, but not to hold the shank C so firmly but that it might swing back when coming in contact with an obstruction, and thus prevent breakage. The rigidity with which the shank is held to the segment or quadrant is to be regulated by the force with which the tapering pin 5 was inserted. In this Fowler and Bacon patent there is no slotted drag-bar performing the double function of draft-

bar and clamp, and the clamping is done in a vertical direction by drawing the shoulders H upward against the segment or quadrant in so radically a different manner from the manner in the clamping the shovel standard in place, as in the patent sued on, that I am forced to conclude that no person having the Fowler and Bacon patent before them as the instructions most certainly could not throw away the segment or quadrant and the shovel-shank, and make another shovel-shank, and slot the beam, and make a clamp of that, which would have to be done in order to produce a device like that in the patent sued on. Therefore, the device shown and claimed in the patent sued on is not shown nor anticipated by the device shown and claimed in the Fowler and Bacon patent.

70 I now come to the Atwood gang plow, No. 54089, and in this patent find that the inventor designed to provide an adjustment for setting the standard of the plow forward or back to any desired angle in reference to the plow beam. He accomplishes his purpose to a certain extent by pivoting to the land side of the plow, or to the lower portion of the standard supporting the plow, a brace whose upper end extended upwardly and through a metal thimble or collar attached to the rear end of plow beam "B," to hold this brace in a fixed position, at such times as the standard of the plow should have been properly adjusted, a screw thread was tapped in one side or one margin of the thimble or sleeve, and turned into this thread so tapped in was a set screw, which by means of a wrench could be turned to any degree of tightness to hold this brace in such fixed position as to keep the plow at the angle at which it was then set for the purpose of running deeper in the ground, or running a less depth in the ground, or for other purposes. I may as well state that to attain this end he pivoted the upper end of the plow standard to the plow beam. All that was sought in this patent was to make this adjustment which I have related. And so far as the state of the art illustrates, it has not been considered an object to be gained to make slotted beam plows, or slotted beam sulky plows, or slotted beam gang plows. There has been some attempts to make cultivators so that they would yield and pass over obstructions, and there has been a good deal of labor expended and a good deal of effort on the part of inventors to construct seeders so that they might be operated on stumpy, rooty, or stoney ground. The inventor here in this patent did not seek to make a slip tooth gang plow, but to adjust the plow for the purposes stated, as to whether the object he sought was attained, it is immaterial. It is sufficient for me to state that a skilled mechanic, having the Atwood gang plow patent before him, with its instructions, in the first place would not make a seeding machine, and in the second place would not make a slotted beam, evidently he would have no use for it in the plow, and not being authorized to make a slotted beam, of course he would not operate the brace or the arm in the same slot which supports the shank of the seeder tooth as in the patent sued on. In fact the state of the art as represented by this Atwood patent is not such as to show that the inventor intended to accomplish the purpose sought to be accomplished in the patent sued on. Had this purpose been accomplished

in the Atwood device, the plow would have been inoperative and useless. There is a feature in this Atwood patent, however, that is very important, and might be explained here; it would save considerable time in any future opinions which I might give. That is in regard to the set screw which is tapped into the thimble sleeve to hold the brace at the rear of the plow standard in a rigid position at such times as the standard shall have been set at such an angle as was desired, that the present means would be sought in the state of the art, that is a set screw being a small point bearing against a surface, so as to hold in a measure by positive force as well as
71 by friction. And I wish to make distinct and clear this point; that is, that all set screws to a certain extent when turned up against even a metal surface, if they do not break the fiber of the metal, they certainly compress the metal to a certain extent, so that they are not only held by friction, but they have the additional aid of positive force. To illustrate, if a book should lie on the table, and I should draw the book from off the table without raising it up, I would only have to contend against such friction as would result from the motion arising from moving that book. That is what we understand simply by friction; that is, resistance to motion. Positive force is entirely different. A chain is held together; that is, the several links by positive force. That is, you have to break the fiber of the metal before you can separate the links, while by drawing one bar of iron off from another you don't necessarily have to break so much fiber of the iron as you would to pull either bar of iron in two. Now Atwood sought this set screw, which would be used in the present state of the art for that purpose, because it embeds itself to a certain extent, either by springing the material or embedding its surface in the brace by indentation. To make this point still clearer, the set screw operates and is resistance to motion by friction and positive force; it operates partially as a pin put through a collar or sleeve to such extent as said set screw might be imbedded in the brace. This indenting of small surfaces of iron into the surfaces of other pieces of iron, which are to move, is the great trouble in getting a uniform movement. I find by experiments with bars of iron placed through mortises, which, together with the bars, were nicely dressed by machinery, and a set screw turned up with a ten pound pressure at various separate points along on the bar, that at some points where the set screw came in contact with the bar of iron that it took one-third more force to draw the bar of iron out from the mortises than it did in other places when the set screw was turned up the same number of pounds pressure. This is in consequence of the imperfections of all mechanism which passes through the hands of human agencies.

Rowell, in the device in the patent sued on, has obviated the objection which I have noted in reference to this set screw, inasmuch as the wood, being of softer material, could not possibly embed itself into the iron, and if the iron did embed itself by wear or otherwise into the wood, the surfaces of the wood would be so enlarged that the embedding would be generally uniform at any angle the tooth might be required to be set for use. It is to be observed that the

larger the frictional surface of the parts in contact the less liability there is of the embedding of one part in connection with the other; hence a greater uniformity of movement would be attained with a greater surface.

It is a fact that these seeding machines are, so far as the teeth are concerned, shanks and drag-bars, in order to be put on to the market at such price as agriculturists can afford to purchase them, must be made as cheaply as possible. In order to attain this end, it
72 is absolutely necessary to arrive at some system of construction which will avoid the use of the planing machine or turning lathe, as all work required to be done by those machines is too expensive. Hence the bars of iron are generally taken as they come from the rolling mill, and of course they are not uniform in thickness. Instead of being very smooth, they are quite rough; that is, as compared with machinery bearings and other kind of mechanics; and for that reason it becomes necessary to have a yielding clamp to bear upon the shank of the seeder tooth or cultivator tooth, in order that if there be (which there always is) considerable inequaliy in the thickness of the bars of iron used, they may not come into contact with so stubborn a resistance in the clamping as to move with such little or such great force that it cannot be reasonably comprehended how tightly turn the set screw to secure the shank of the cultivator tooth in the camp.

Again, this tooth ought not to be clamped too tightly, because several of them might strike a root at the same time, and although they might be swung back out of the way without being broken, or without breaking the drag-bars, yet they would jerk the tooth and make it very annoying for an operator to do such work as he would otherwise do with the machine the teeth of which were more uniformly clamped in the drag-bars; and from experiments made, not only in clamping iron jaws to rotate in wood or have a longitudinal movement, or reciprocating movement in wood or other material, it is found that where the movement is not frequent, and is not so rapid as to create great friction, that the cheaper material, more fibrous material, such as wood, brought in contact with iron or other similar matter, is the best calculated for what is termed rough machinery, in which class these seeding machines or cultivators may be placed, so far as the slip tooth and drag-bar are concerned. That experiment, made personally, warrant me in stating that, although a tooth shank be planed in lathe, and the slot in which it was to work should also be planed, yet, if a set screw was used, when we take into consideration the fact that the burning of the metal by oxidization (rusting) would unite the parts, or interweave the external fiber and disintegrated by rust, there could not possibly be any such certainty of movement on the part of the shank as would be the case where said shanks hold in wooden bearings. It is admitted that the shanks in the wood would probably rust as much as though they came in contact with iron, but the wood certainly would not rust. Hence there would be at least half of the objection removed in relation to lack of uniformity of friction by the use of wood as a

clamp, to what there would be provided the clamp and the shanks were iron.

To avoid the embedment of set screws bearing against metal surfaces which are to have motion, anti-friction plates are usually interposed between the set screws and the moving surfaces of such large surfaces as compared with the moving bodies, as will at least prevent any embediment of one part in the other; and generally these interposing plates are best adapted for the purpose when
73 they run the entire length of the moving surface, because the moving body then cannot wear in any particular part wedge-shaped; and then, by tightening the set screws, there would be a practical uniformity of movement, because there would be a uniformity of thickness in the part moving.

Again, it might be said that no lubricating material is used on these seeding machines. Hence, set screws would be very much more likely to embed themselves than they otherwise would.

Adjourned until Monday morning, at half-past 8 o'clock a. m.

MONDAY MORNING, 8.30 a. m., *October 20th*, 1879.

Mr. CHAPIN re-called:

Whiting and Mapes patent, No. 51768. My attention is now called to the Whiting & Mapes patent, No. 51768. I find that there has been an attempt made on the part of the inventor to provide means for a yielding movement of the tooth, providing it should come in contact with some obstruction which might do injury to the mechanism. In some respects, particularly a brace connecting the draw-bar with the shank in the tooth, is similar to the patent issued to Rowell and Lowth reissue, with this distinction—the brace (small r.), as in a friction brace or clamp, in its connection to the shank of the shovel, is pivoted. The upper, or elongated portion of the shank of the shovel passes through the slot in the beam or draw-bar, the slot being vertical, but the slot does not extend clear through the rear portion of the bar. It is therefore not an open mortise like the slotted mortise in the drag-bar shown in the patent on which this suit is founded. Other means are provided for holding the tooth in position to till tillable soil in this Whiting and Mapes patent than those means used in the patent sued on; the means being such that an open mortise or slot could not be used to advantage as the slot is used in the patent sued on. In the latter patent the upper portion of the shank of the shovel is clamped in place by drawing the two jaws together, compressing the said shank between them. Hence the slot or mortise being an open one, admits of such a contraction or expansion of the jaws forming the clamp as is necessary to give to the shank of the shovel a proper hold in the drag-bar; that is, the slot in the patent sued on being an open one, or an open mortise, the jaws can be drawn with any required force against the shank of the shovel. In the Whiting and Mapes patent this is not the case, nor could it be from the fact the mortise, being clogged at both ends, could not be made narrower at those points by any ordinary clamping. And if the

clamping bolt were put through it to unite to hold the shovel shank, as in the patent sued on, it would draw the margins of the mortise together in their central parts, and if the bolt were tightened to any extent, the line describing the longer sides of the mortise would be two curved lines with their convex sides placed
74 toward each other. Such a form of mortise could not be of service in the Rowell device shown in the patent sued on. The mortise in the Whiting and Mapes patent through which the shank of the shovel passes (as it is) should be closed at both ends, because the power applied to clamp the shank of the shovel in the mortise is placed on one side, or one margin of the mortise, and when this power is put into use it presses the shank against one side of the mortise only, and has a tendency to make the mortise wider in the center and narrower at the two ends, which is exactly the reverse counterpart to the shape that the mortise would have, provided a bolt was put through it, and the tendency of the bolt were to draw the two margins of the mortise together. An eccentric is affixed to the top of the draft-bar in the Whiting & Mapes patent, and by means of a longitudinal slot which its supporting bolt may move in, it may move forward and back on the draft-bar to accommodate the position which the shank of the shovel may have by tightening this eccentric, which I call a cam. The shovel standard is alleged to be held in such position as to have a yielding movement. The use of an eccentric, or a cam for any such purpose is a mechanism, that is intended to hold positively other mechanism from moving in a certain direction, but to allow the mechanism which is held to move in an opposite direction very readily. Now, in this construction in the Whiting & Mapes patent, when this cam or eccentric alleged to hold the shank of the shovel be made to lock the tooth firmly enough to till ordinary soil, provided the cam was placed so that the increased wedging force would be in one direction, the tooth would be held so rigidly in place that it would not slip back without breaking the parts in the pressure. If this eccentric be placed so that the wedging force be in the other direction, the tooth would not be held in place, even to till tillable soil. Cams or eccentrics, when used to hold any mechanism in a given position, are simply one form of wedge, the power of which comes directly in contact with the thing to be held, and is one of the most objectionable pieces of mechanism for that purpose that is used any where in mechanics, except the set-screw; and in support of my theory in regard to the draft-bar in Whiting & Mapes patent I will say, that the inventor anticipated the same objections to the spread of this slot, which I have anticipated, and in order to provide against the pressing open of the slot at the rear of the draft-bar, a plate of iron of some considerable thickness is secured to the top of the draft-bar, and the mortise for the sliding of the eccentric, and the moving of the shank of the shovel are made through this plate in position to conform to the position of the mortises through the wooden beam. Now, if this plate should be put on to the top of the draft-bar in the device shown in the Rowell patent sued on, and all the other devices were the same in this last-mentioned patent, the

plate would, by its inflexibility, prevent the clamping-screw from drawing the edges of the draft-bar sufficiently together to hold the upper end of the shovel-standard in position. What is
75 sought to be accomplished in the patent sued on by an open slot is absolutely void in the Whiting & Mapes patent. In the patent sued on, the jaws are drawn together as before stated, obviating the possible splitting of the beam by any action of the clamping of the device; while the device in the Whiting & Mapes patent tends to split the mortise open. I mean that if the eccentric used in the last-mentioned patent were strong enough, a special power applied, of course the marginal supporters of the morties would be rent asunder, and the shovel-standard have no support. Again, in the patent sued on all the clamping device is within the drag-bar itself. No extra mechanism being anywhere employed to aid in that purpose. And while in the patent sued on the provision made for the slipping of the tooth is sufficiently perfect to answer the purpose, the device in the Whiting & Mapes patent could not answer the purpose at all. And the clamping device is of such a character, and so uncertain in its action, that in my judgment I don't consider the device in the Whiting & Mapes patent practically a slip tooth at all, but in practice would simply be an adjustable tooth, and might, as such, perform the function, but any mechanism which tends to split open a mortise in holding the shovel-shank is so distinct in its principle from a clamping device which has a tendency to close the jaws, that I feel warranted in saying, that a person having the Whiting & Mapes patent before them, would certainly have to violate the whole theory and tenor of the patent if they undertake to hold the tooth by clamping the jaws together instead of by forcing the jaw against one margin of the slot, and thereby widening the slot, or throwing the jaws of the slot apart.

I don't really see anything in the Whiting & Mapes patent, which I find in the patent sued on, except the mortise through the beam. But there is not an open mortise, but simply a mortise. But so long as the mortise was old at the date of all these patents and exhibits, I cannot say that in the patent sued on there has been anything appropriated that is shown in the Whiting & Mapes patent.

(The Francisco patent.)

My attention is next directed to the Francisco patent No. 46664. Now I find a mortise through a beam in the device shown and described in these letters patent. It is not an open mortise, and the shovel-standard, although being placed through the mortise, is not clamped in place by being compressed between the two jaws of an open mortise, as in the patent sued on. It is true it is pivoted in the mortise, and by mechanics may be adjusted to have any desired pitch, which adjustment is very common in slip tooth seeders. The object of the inventor was in this Francisco patent, to provide means for the yelding of the tooth, or its springing back providing it should meet an obstruction which would do injury to the implement, but he has his own and peculiar way of doing this. That is, on top of the drag-bar and in front of

the upper portion of the shank of the tooth he has placed a slide, which is slotted out at its end, and held to the top of
76 the draft-bar by a bolt and nut. And it was the intention of the inventor to so tighten this bar or plate so secured to the draft-bar, that if too much resistance were brought against the tooth for the safety of the implement, that this slide would slide forward under its clamping-bolt, and thereby allow the shovel to swing back on the pivot in its shank, and be relieved from liability of breakage. But the means, while entirely different from those shown and described in the Rowell patent, for the purposes sought, are very defective, and are not the means which would be sought at the present time, or by a better class of mechanics at that time, for holding the tooth to till tillable soil, and yet holding it to yield when coming into contact with such force as would injure the tooth, but the shank of the shovel is not clamped in the slotted beam at all. It may have a very loose and slotted movement laterly in the beam, and yet be held by that plate so as to till tillable soil. Now, in the room of making a friction surface in this Francisco patent between the metal of the shank of the tooth and the draft-bar itself, it has, by a separate piece of metal put on top of the beam, whereby the edge of the front part of the shank of the tooth, a very narrow bearing comes in contact with the iron plate, and the bearings are so small, and their relative positions are such in view of the imperfections of mechanics, that there is a difficulty of determining the angles of its bearing, and the uncertainty of one metal operating upon another with any degree of regularity, it is my opinion it would be impossible for the most thorough expert to set a series of teeth in the Francisco device so that one or more of them might strike against a too great resisting force, and at the same time be operative, without doing material injury to the machine. The means for determining the friction between small surfaces against another where there is liability of compression or indentation to any extent whatever, are wholly inadequate to enable even a most skillful expert to determine what results will be in the movements of bodies under frictional pressure, where the construction is of the kind as shown in the Francisco patent. The inventor in this patent, in conceiving it, had no idea of clamping the shank of the tooth between jaws formed by slotting the rear portion of the draft-bar. This is evident, because he has only used a mortise, not an open mortise, and hence the construction is such that there could not be such a lateral movement of the margins of the mortise as would be necessary to perform the result which Rowell has accomplished in the patent sued on. Hence I am, according to the best of my judgment, compelled to say that I don't find in the Francisco patent the invention described and claimed in the patent sued on, neither do I find the same mechanical construction.

(The J. H. and J. W. Thomas patent.)

I find in these letters patent a draft-bar, whose rear end is provided with an open slot, or open mortise, in which is clamped the upper end of the shovel-standard, on the same principle precisely

as is the shovel-standard and the draft-bar described in the letters patent sued on. The method of clamping is identical, and
77 all the benefits to be derived by the yielding surface of wood against iron in this agricultural implement are found in this patent of Thomas'. There is an immaterial distinction in the form of the upper end of the brace, or enlargement of the shovel-standard, in order to give a leverage at a certain distance from the pivotal point of the shank, in order to hold the standard in position without turning up the clamping bolt so tightly as to injure the parts. In this form the upper portion of the standard is made somewhat semi-circularly, and the pivotal bolt in the room of passing through the main standard passes through the end of the semi-circular part, and the clamping bolt passes through the jaws of the clamp near the main portion of the standard of the shovel; but the same result is obtained by the same slot in the draft-bar, by shovel-standard, which has an enlargement at its upper end to give leverage against the opposing action of the earth; and if an obstruction which would otherwise injure the machine should come into contact with the shovel, the shovel-standard would swing back on its pivot in the same manner, and be resisted in its movement by precisely the same frictional force as is the case in the patent on which this suit is founded. Now, the inventor in the patent sued on appears not only to have utilized the open slotted beam for the purpose of giving the proper friction upon the shovel-standard, but in contra-distinction from everything presented so far for my consideration here, he was the author of, and entitled to, that enlargement of the upper end of the standard to get a leverage some distance from the pivotal bolt, to attain a leverage so that he might hold the tooth in a beam of very much smaller size than a standard could be held, provided this leverage had not been provided. It is also singular that the pressure on the pivotal bolt is downward during the backward movement of the shank of the tooth, as it is downward during similar movements of the shank of the tooth in the patent sued on.

I am a practical mechanic myself, and can, with my own hands, make all this kind of machinery, although at present out of practice. As such mechanic I am also familiar with kind of device. I am satisfied it would be a mere matter of choice with a person skilled in the art as to what form he made the upper portion of the shovel-standard, provided he got a distant point of leverage from the pivotal point, in order that he might hold the shovel-standard with a friction force to till tillable soil, and yet with only so much force as might be overcome from the tooth coming in contact with an obstruction, such as wood or stone. The shape or form of the upper portion of the shovel-standard that this leverage point is attached to, is absolutely and wholly immaterial. With this exception, I can conceive that perhaps in plaintiffs' model No. 1, a shovel-standard might be made of a little less metal than when the form of the shank is of the contour shown in Thomas' patent. But I imagine the form would be largely governed by the material at hand, and the facilities for manufacturing the material where cheapness and durability were to be attained in putting upon the market

a large number of machines. There is certainly no in-
78 vention in the device shown in the Thomas' patent over and above the device shown and claimed in the patent sued on. There is an absolute identity in the open and slotted beam and enlarged upper shovel standard, pivotal point, and a friction point some little distance from the pivotal point, or such a distance as will insure a leverage to hold the tooth in position to till tillable soil. That leverage is always required in the use of the machine. And it is desirable that when a greater force comes against the shovel, than the shovel ought to incur in ordinary tillable soil, that the tooth should slip back out of the way. In the patent sued on, of course the state of the art would not warrant the claim broadly of the slip tooth. In my judgment any slip tooth made subsequent to the letters patent 36,672 would have to be for construction. There is no doubt but that the form shown in the patent sued on is the better form as to material, but as to the teeth being held in place, there is no difference between the form in the patent sued on, and the form shown in the Thomas patent. In order to make these several forms appear more readily to the comprehension, I will refer to the same models here referred to by Mr. Dayton, showing the enlarged upper ends. Dayton models No. 1 to No. 5 inclusive. And I will say that I agree with Mr. Dayton in that regard, that these several models are all within the scope of the invention claimed and shown in the patent sued on. That if Mr. Rowell invented anything at all, it consisted in the slotted beam, and in holding the shovel shank in that beam without any other mechanism, or attachments, except the pivotal and clamping bolt, which bolt passes through the beam, or draw-bar. This appears to be the essence of his invention, and I regard all slotted beams that have placed therein shovel shanks, with such an enlargement at their upper ends as will secure such leverage, as against the action of the earth against the shank of the shovels, to be the invention described and claimed in letters patent on which this suit is founded. That Mr. Rowell seems to have taken a long forward step in the art, in simplifying his slip tooth, rendering it more certain in its operation, less liable to get out of order, very much cheaper in construction, and every way a superior agricultural implement to any that have been before produced; and this patent of Thomas' is the first one that has come under my observation that seems to have in it the real principle and combination of parts shown and claimed in the letters patent on which this suit is founded. An ordinary farm hand would carry the same wrench, to clamp shovel-standard in the drag-bar in the Thomas patent that he would if he were using one of the Rowell machines; and when he was more than an ordinary observing farm hand, so far as the operation and effect of the machine are concerned, he could not possibly notice any difference at all, as to what trifling more power or less power might be required to hold the device in the patent sued on, or in the device shown in the Thomas patent, would be entirely immaterial, and never would be noticed by
any ordinary person operating the machines. This is the
79 first (that is the Thomas patent) mechanism that I ever ob-

served which permits the jaws to have such a lateral movement as to always ensure the clamping of the shovel standard in place like the Rowell. It is well to observe here in the construction parts that there is no doubt but that iron between iron jaws would wear longer than iron placed between wooden jaws; if there were a great deal of movement in the shovel standards in the Rowell invention set forth in the patent sued on, those jaws, of course, would wear to a certain extent, but then the flexibility of the jaws on either side of the open mortise or slot, would permit the jaws to draw together, and accommodate themselves anywhere, so long probably as the machine might last. I might observe, it is not the business of these machines to go in where there is so many stumps that the operator has nothing else to do but adjust these teeth. In some fields they can be used to greater advantage than they can to sow the seed by hand. I observe also, that one tooth in the Thomas patent, or the whole of the teeth coming in contact with an obstruction, would be thrown or move backwards with precisely the same ease that they would be in the Rowell invention, and with the same certainty, and they could be replaced again by the foot of the operator in the same manner, which is not the case in any other patent to which my attention has been called. The surfaces are so large in the Rowell invention that the shank of the tooth could not well imbed into the wood under the pressure that would be required to hold the standard in position for tilling tillable soil; and as regards this, the same condition follows as in the Thomas patent, and all the substantial advantages that Rowell has in his patent, are retained in the Thomas patent, there being perhaps some difference in degree.

Now as regards the curved brace in the Rowell patent, I will say in mechanics, engineering, and carpentering, the governing class of mechanics to which this brace is allied, states the fact, that a brace may be a piece of material which either supports, as when a strut, or being pushed against, or may be that which is pulled on. To illustrate—if the bent in a building stand east and west, and that bent be braced, the braces also running east and west, if those braces be not pinned, if the wind should blow from the west, only half those braces would hold; the other half would be very much better if rods hooked in, or strings or chains. Hence a brace may be either that piece of mechanism which pulls or pushes, generally signifying arm. The term 'brace' in the Rowell patent sued on, perhaps might be better stated as an arm, the original form of the word being arm: but it is immaterial as to what it is called, its function is as I have stated, to furnish a frictional bearing af a proper distance from the frictional point, and it don't make any difference whether it be straight, semi-circular, or solid, only so that that distance for a pivotal point from the pivotal point is attained.

This is clearly a brace in the Thomas patent, because there is leverage, and leverage cannot exist in any instance without there is connected with that some form of brace. I therefore find the device described and claimed in the said J. H. & J. W. Thomas' patent to be nothing more than a modifi-
80 cation, what any ordinary skilled mechanic would make, and

have a right to do under the letters patent on which this suit is founded. Mr. Rowell's object was not to make a brace for any purpose to brace his tooth, this is apparent from the function of what he calls "brace," but simply to enlarge the metal, extend out something from the shank in some direction in some form, to get a frictional power some little distance from the pivotal point, that is, get a leverage there that he might hold the shovel standard in position to till tillable soil. To illustrate—supposing the brace be cut off entirely from the standard in the Rowell device, and a clamping bolt through the beam be substituted for the pivotal bolt through the main shank of the shovel standard, and then this clamping bolt be turned up with any and all the force that could be applied, I am positive that the ordinary size of drag-bars, the kind of wood that is employed, that such would not hold at all, it would cut the wood to pieces. In the first place, the friction would not be enough between the wood and iron to hold it, the surface being too small, and if the clamping bolt were turned up tightly enough to keep the shank in the bar, the pressure would be so great against the wood as to tear the slot to pieces, it would be inoperative. Of course I cannot enter into the conceptions of the inventor. I have to form my opinion from the tracks which I see he has made, and in this regard I find all the characteristics, important features of the invention, and all the utility and simplicity and durability of the Rowell device in the device which is shown in the Thomas patent. And I am led to believe that if the invention of Rowell in the patent sued on does not cover the construction in the J. H. & J. W. Thomas patent, then he did not invent anything at all, because the same result is attained by the same mechanical means, and by an arm or brace for getting a frictional point at a certain distance from the privotal point, and the shovel standard moves back in the same manner; it is held between wood of substantially the same amount of friction, and if the tooth should have been moved back by too great a resisting force it would be replaced in the same manner; and the change between the Rowell device and the device shown in the Thomas patent is a mere mechanical change; there is no invention in it at all. After the beam was slotted, and the beam was made to perform the double function of the beam and the clamping device to hold the slip tooth in position, there is no absolute invention in making the same thing. The object was not to make a brace, but to get a pivotal point, which point has been attained in the Thomas patent by a semi-circular top in the room of extending the enlargement down under the bar. This has been made by extending it around over the top.

(Witness shown the devices marked "Exhibit Defendants' T-Headed Tooth," "Defendants' Modified Tooth and Beam," "Eberly Tooth and Beam," Modified Eberly No. 2.")

81 Q. Will you compare these several exhibits with the plaintiffs' exhibit marked "Plaintiffs' Tooth and Beam," and state in what respects they differ, and in what respects they agree.

A. The "Modified Eberly No. 2" is no modification of the Eberly

at all; it is a different thing. What I have termed in the Eberly as an auxiliary drag-bar, being substantially a fixture connected to the shovel shanks is not shown in this modification, but the auxiliary drag-bar is pivoted to the shovel shank, and a device so constructed might, to a certain extent, be operated as a slip tooth; but it differs from the invention shown and claimed in the patent sued on, in that there is no slotted beam; that there necessarily is other mechanism. It has the auxiliary drag-bar connected with the beam and shovel standard, whereby the slipping function is attained, if such function be there at all, and with the somewhat restricted construction of the device in the patent sued on, as I have given such construction, I would say, that I do not find in the modified Eberly the invention shown and claimed in the Rowell patent. In the room of being a slotted beam to hold the slip tooth in position, a rabbeted beam and clamping bolt to hold a slotted auxiliary bar to the beam. Therefore the beam in the modified Eberly, not being so constructed as to contain within itself the entire elements of the drag-bar, and of the clamping device to hold the slip tooth in position to till tillable soil, yet so as to swing back when meeting with extraordinary obstruction, I don't find anything meeting the claims in the patent sued on in the modified Eberly. A person following the instructions in the patent sued on certainly would not make this modified Eberly. He would not certainly be allowed to use the slotted auxiliary drag-bar. Nor would a skilled mechanic be permitted to rabbet a beam instead of slotting it.

Exhibit "Eberly Tooth and Beam" differs from Exhibit Modified Eberly in no material particular, except that the slotted bar in Modified Eberly is placed back of the shovel standard, the slotted bar in the Eberly tooth and beam is placed in front of it. The same principle is involved in the one as in the other.

I might add that in the "Emery Tooth and Beam" the beam is not rabbeted, but to get an equivalent effect to a—"Exhibit Eberly"—it is bent, simply being a difference in mechanics, not in principle. The "Eberly Tooth and Beam," "Modified Eberly Exhibits," do not, in my judgment, contain in any respect whatever the invention shown, described, and claimed in the patent sued on, inasmuch as in addition to other points of difference; the respective beams of draft-bars in these exhibits do not contain within themselves the clamp to hold the shovel standard in position to till tillable soil.

(Exhibit Defendants' T-Headed Tooth.)

In "Exhibit Defendants' T-Headed Tooth" the pivotal bolt and the clamping bolt are both one; the T-head being formed on the top of the standard to attain such friction as is necessary to hold the shovel in position to till tillable soil, by a double leverage, one in front of the pivot and one back. I don't think this
82 construction would be very certain in its use, from the fact that the power applied to the pivotal bolt (which is also a clamping bolt), would, in consequence of the spring of the material, decrease in force from the pivotal bolt outward to the end of the teeth. Yet, if this tooth should be so constructed as

to give sufficient resistence to the movement of this shank, to which they are attached in order to hold the shovel in position to till tillable soil, I should conclude that it might come within the invention patented by Mr. Rowell, as in the patent sued on, for it would appear to me that here would be a substitution of the extra projection here. This T would be in a measure equivalent to the clamping bolt. That is, by extending it out far enough, it is evident to me there would be friction enough to hold the tooth in position to till tillable soil. It would be a very poor form of the Rowell device. It would be less certain, and certainly more expensive, and it would not be the form that would be chosen by good, skilled mechanics to make in following the Rowell invention. But still, as the beam is slotted, and contains all the elements of the draft beam, and a means of holding the teeth in position to till tillable soil—that is, if it will hold them, my opinion is it would come within the scope of the Rowell patent. I am satisfied, of course, that by making the ends of the T's a little thicker than the bar is made, whereby there might be a little spring in the jaws of the clamp on either side of the slot, that the tooth would hold there and work practically. It is also true that if the T's, the wings forming the T's, were made thinner at the edges, so there would not be very much friction, except where the bolt passes through the standard, it would not hold, the shank would not be held in position to till tillable soil, and the device being inoperative, and the clamp being a feature of the Rowell invention, then I would not find the Rowell invention in the "defendants' T-headed tooth." But if the shank should hold to till tillable soil, it would come within the scope, undoubtedly, of the invention patented by Rowell.

"Defendants' modified tooth and beam," as the construction of that tooth and beam is shown in the Thomas patent, I notice in this one, however, the clamping bolt is removed, but I can see very readily that if the forward end of the enlarged part, or arm, or brace of the shovel standard were made somewhat thicker than the iron is, where the pivotal bolt passes through, that the said pivotal bolt would operate as a pivotal bolt and clamp, and clamp the metal of that projecting arm or brace sufficiently tight in the slot to till tillable soil, and, in that event, I think it would be within the scope of the Rowell patent. I think it would be substantially what he claims.

I would say, again, if the front portion of the arm in this exhibit were made so much thinner, that when the pivotal and clamping bolt was drawn up as tightly as convenient, there would be no friction of the wood, or not enough friction of the wood on this arm to form a leverage at a distance from the pivotal point to hold the shank in position to till tillable soil, then the device would
83 be inoperative, and not come under anybody's patent; it would be useless. One of the functions sought to be obtained in the Rowell patent would not be found in that device. But, being a practical mechanic, and understanding where the friction is to be applied, I am satisfied that the thickness of the upper portion of this standard might be greater, so as to produce an amount of friction

required to till tillable soil. But it would be an inferior construction to that shown in the patent sued on. But still, if it held at all, it would have the same movement, till the soil just as well, and, if it struck an obstruction, the shank would move back just as readily, on the same plan and principle, and the operator would adjust the tooth back in the slot in the same manner. While there are practically few bolts in the Rowell patent passing through the beam, if the operator found only one nut and bolt in "defendants' modified tooth and beam," he would put his wrench on that nut to turn it up, without looking for another. He certainly would not bother himself about looking for a nut or clamping bolt about the machine that did not exist, and the nut being in the same place as in the other machines, of course he would turn that one. All the advantages of wood coming into contact with metal are attained here in "defendants' modified tooth and beam." I don't think that in the construction of this so-called tooth and beam, as before me, that it could be made practical. I don't think that the clamping bolt could be turned up tight enough to hold the shank in position to till tillable soil.

(Witness shown Exhibit, marked "Complainant's Tooth No. 2.")

Q. State whether or not you find in this exhibit a bolt through the head of the tooth; and, if so, whether or not it acts as a pivotal point for the tooth to turn back and forward on.

A. I have examined said exhibit, and I find the head of the tooth, or what I term the top of the standard, is provided with a bolt, passing through the jaws of the draw-bar, and through the standard, and operates as a pivot for the shovel or standard to turn on to a certain extent.

Q. State whether or not the bolt which passes through the shank of the tooth, if necessary, could be used for clamping purposes, in addition to the clamping bolt in the end of the slotted beam.

A. The pivotal bolt, if provided with a nut and thread which might be turned up, and clamp the forward part of the shank of the shovel to a certain extent, but in this construction it would not clamp the jaws of the draw-bar firmly enough to the standard to attain that amount of friction that is necessary to till tillable soil, independent of some other means for clamping. The other means being the rear clamping bolt.

(Witness shown Exhibit "Certified Model David Eberly Shovel Plow.")

Q. State whether or not this model is constructed in accordance with the drawings and specifications of the Eberly patent, dated December 22nd, 1857, No. 18894.

84 A. I have heretofore had occasion to examine this model, and state that in every respect it is substantially the same device that is shown and described and claimed in the said Eberly patent.

(Witness shown exhibit marked "Defendants' Tooth and Beam.")

Q. If this tooth just referred to in practical operation in the field should bend below its connection with the draw-bar, state whether or not in your opinion it would be any evidence of difference in construction or mode of operation from the plaintiffs' device.

A. None whatever.

Cross-examined by Mr. WOOD:

Q. Besides testifying for Mr. Rowell as an expert in the previous patent suits, have you been employed by him professionally as counsel, or attorney; if so, state the nature of your employment?

A. I have not.

Q. Have you been consulted by him in years past, in regard to his patent matters?

A. I was employed as expert in one or two suits that he brought for infringement on patent. And as such expert I gave him I think such information at that time as an expert and patent solicitor would have given him. I was his attorney for reissue on the patent, and while I don't remember what conversation we had, I know from my ordinary practice I should not have given him advice unless he paid me for it, and he didn't pay me for it, so I didn't give it to him. He certainly paid me as patent solicitor, and for my services as expert.

Q. What patent did you reissue or assist on reissuing for him?

A. Letters patent No. 36672, reissue No. 3373. This was the patent those suits were on I have referred to. The second claim was my work as attorney.

Q. In the use of these seeders, 12 draw-bars being used, are teams usually employed by Rowell?

A. Yes, sir. I never saw but two horses attached to the machine. I have heard of their using one.

Q. Supposing a pair of horses, weighing say 2,000 pounds, were drawing one of these seeders at a speed of six feet per second, and one of the seeder teeth should strike an unyielding obstacle while the team were traveling at that speed, about what would be the force of the concussion of the blow upon the seeder tooth?

A. Well, there being no data given as to the kind of soil which was being tilled, and the force with which the tooth might be held by friction, it would be impossible to give the extra resisting force.

85 But if the tooth were properly adjusted to till tillable soil, which adjustment would be in my judgment and experience the force required to till tillable soil in order that they might always remain in place, it would amount to about one-sixth of the power applied to move the machine. That is, it would take one-sixth more power to draw the machine during the time this tooth was moved back than it would to draw the tooth through the ground.

Q. Assuming the power applied to draw the machine to be equal to one-fourth of the power of the team, the speed of travel being six feet per second, and the tooth being rigidly affixed so as to receive the full concussive blow, estimate as nearly as you can the force of that blow.

A. The tooth being rigidly fixed, it would depend upon the resisting force of the iron. If the iron were strong enough, it would stop the team. If the team were strong enough to break the iron, the iron would break. I would have to calculate the resisting force of the iron under those circumstances, in order to determine what the resisting force would be. I will say, however, if the breaking of it jerk the team down to half its speed, why the resisting force would be half the power applied. But in neither of these questions has there been given sufficient data to determine thereupon the correct mathematical calculation. And as friction is a subtle substance to ascertain and to correctly find out by experiment, I don't think that any man, no matter how scientific, could make a series of calculations on one day that would be duplicated on the same ground with the same team the next day. This occurs in consequence of the imperfections of everything that human hands have hold of, that human brains undertake to comprehend.

Q. You are to assume that the teeth are rigid enough to withstand the force exerted by the team, and in traveling at the given speed of six feet per second, can you, or can you not, give any kind of estimate as to the amount of power, or the concussive force which a given tooth would receive to stop the horses when such tooth would strike against an unyielding obstacle, the weight of the team being the same?

A. 6,000 pounds. According to the general rules laid down in dynamics, about that.

Q. What is that rule of dynamics by which you make this calculation?

A. Multiply the weight of the plow by the number of feet per second momentum.

Q. What would be the expenditure of power ordinarily which an ordinary man would give by a smart kick of the foot upon the teeth of one of these drag-bars?

A. What, to replace it, or kick it out?

Q. Say kick it out?

A. That would depend upon the soil that tooth was adjusted to till. I understand the question to be this—that when the
86 tooth is adjusted to till ordinary tillable soil, what power would be necessarily applied to turn the tooth on its pivot backward, so as to pass over an obstacle?

Q. You misunderstand my question. My question is, What was the extent of power which an ordinary man could apply on that operation of moving the tooth by a smart kick of the foot?

A. There is no rule laid down in dynamics, as applied to moving bodies, by which I could determine what an ordinary man could do, or anybody else. There is so many things to be taken into consideration. It may be twice or three times as much as is required to till the soil, and yet the tooth would slip out without any inconvenience to the team. Counsel don't give any data to form any correct estimate on. I might give it a good deal less kick than another man. Some could exert in a kick from the foot what would be equivalent to a horse power; some might break a human leg in

exerting a force of one-eighth of that amount. The relative power of the human family is too various for me to form any estimate.

Q. Do you think an ordinary man, with a smart kick of the foot, would ordinarily give a blow greater than the force of 200 pounds?

A. That is indefinite. I should call myself somewhat perhaps less than an ordinary man in physical strength.

Q. What do you estimate your physical strength in that direction to be?

A. That would depend upon whether a man were standing still, or had put himself in motion so as to have considerable momentum. And it would depend upon the capacity of the bones and muscles for sustaining the shock. I cannot form an estimate from the data given.

Q. Then you can give no kind of an estimate as to the force of the blow which an ordinary man could deal and readily apply to the teeth upon these drag-bars?

A. No; nor any other man.

Q. It might be 2,000, and it might be 20 pounds?

A. Oh, no.

Q. Give me the range, as nearly as you can?

A. I suppose an ordinary man might kick with his foot two or three hundred pounds. Some other man, an athlete, for instance, could exert a force perhaps two or three times greater than that. It would depend upon whether he was standing still or in motion. I have seen some experiments made in that direction, not with the foot, but with the hand; I have known blows of the fist driven that would break substances that it would take a force of one thousand pounds to produce the same result.

Q. Do you call that ordinary force or extraordinary?

A. The blows were struck by persons who had taken lessons in fencing, boxing.

Q. Would you call it ordinary, or extraordinary power?

87 A. I should term it extraordinary. Certainly a person of ordinary strength with the fist could not exert any such power with safety.

Q. Whiting and Mapes' patent, the cam or eccentric for holding the shovel standard in position were removed, also the plate (small "*p*"), and the beam slotted out so as to form the same kind of a slot as in the Rowell patent, and a through clamping bolt applied to the rear, the same as in Rowell's to clamp the shovel standard, and assuming that the upper end of the shovel standard (end one) had surface of metal enough to hold the tooth in position to till ordinary soil by the friction exerted by the champing bolt; under such assumption would such a device be substantially like the Rowell reissue sued upon?

A. No; because there would not be in it an auxiliary draft-bar "R" yet retained as a part of the eccentric to perform any function that might be performed, and because in this bar is not retained the whole device, the whole device would not be within the slotted beam. And hence would not be equivalent to the invention, in

my opinion, as I have given it in regard to the Rowell patent sued on.

Q. In speaking of the modified Eberly Exhibit No. 2, you referred to its having an auxiliary drag-bar; I understand you to refer to the slotted bars in the rear. Why is that an auxiliary drag-bar?

A. Because it assists in keeping the standard in position for tilling the soil. That is, it helps to hold the standard.

Q. That is, in other words, the power of the team is applied in part through this bar, is it?

A. Yes; and the set screw is turned to hold the slotted bar to the beam, the draw-bar, the slotted bar, and the shovel standard practically become one mechanism. That is, they might all be then made for tilling tillable soil of one piece of metal, and perform the same function. Hence, of course, the power of the team is exerted on that auxiliary bar.

Q. That is why you call it an auxiliary drag-bar, because part of the power is exerted through that?

A. In part that, and because it assists in holding the shovel standard upright. The standard would not be held in this device were it not for this, so as to till tillable soil.

Q. Then if I understand you, that part of the modified Eberly No. 2 is an auxiliary draft-bar, because it assists in holding the tooth in position, and because the power applied to the tooth through the beam is partly through this bar?

A. I might say yes, substantially.

Q. Is it not a fact, that substantially the holding power is conveyed through this auxiliary drag-bar?

88 A. Yes, sir; I think that in an ordinary construction of such a device as this, that a skillful mechanic would not rely on clamping the upper end of the shovel standard sufficiently tight in the draft-bar to have the shovel perform any particular function on that account.

Q. If I understand you correctly, you state that any enlargement of the upper end of the tooth of the Rowell patent, which would furnish sufficient frictional surface outside of the pivotal bolt to allow it to clamp and hold the tooth in position practically for tilling ordinary soil, and yet allow it to yield upon striking an immovable object, would be within the Rowell patent, even if it was round or semi-circular?

A. Yes, sir; but I state at the same time that that device, which counsel has described in his question, should be clamped in a slotted draw-bar.

Q. And under that definition of the patent you would include the exhibit Mast drag-bar, would you not?

A. Yes, sir; I should in my judgment conclude that this drag-bar (Exhibit Mast drag-bar), with the slotted end, and inserted therein the mechanism for holding the tooth, is a palpable copy of the Rowell patent sued on.

GEORGE L. CHAPIN.

89 United States Circuit Court, Eastern District of Wisconsin.

JOHN S. ROWELL and IRA ROWELL
vs.
EDMUND J. LINDSAY and WILLIAM LINDSAY. } In Equity.

Testimony under the sixty-seventh rule in equity, as amended, before Samuel Boyd, court commissioner for Outagamie county, Wisconsin, pursuant to notice, on behalf of defendants.

Present for complainants, James J. Dick; for defendants, E. E. Wood.

F. E. SAKER, being duly cautioned and sworn, says:

(Complainants object to the deposition of witness being taken, on the ground that no notice was given in the answer of the name of the witness, under the statute requiring such notice to be given.)

Ques. 1. State your name, residence, age, and occupation.

Ans. F. E. Saker; Appleton, Outagamie county, Wisconsin; 24 years of age; foreman of blacksmith shop of the Appleton Manufacturing Company.

Ques. 2. How long have you been foreman?

Ans. Four years and a half.

Ques. 3. Does your company make slip-teeth and drag-bars for agricultural purposes? If so, in what machines are they used?

Ans. It does; they are used in broad-cast seeders and corn cultivators.

Ques. 4. Look at implement marked Appleton Tooth No. 1 and Appleton Tooth No. 2 and Appleton Tooth No. 3. Do they or do they not represent the teeth made by your company?

Ans. They do.

90 Ques. 5. How many seasons did they make tooth No. 1?

Ans. One season.

Ques. 6. How long did they make tooth No. 2?

Ans. Two seasons.

Ques. 7. And how long tooth No. 3?

Ans. Two seasons.

Ques. 8. Have you made a calculation showing the comparative cost of making the iron work of tooth No. 2, as compared with the cost of tooth No. 3? If so, what is the comparative cost?

Ans. I have made the calculation, and find about half a cent to the tooth difference.

Cross-examination:

X Ques. 1. When did you make this calculation?

Ans. First time, about two years ago.

X Ques. 2. At what time did you make the calculation the last time?

Ans. Last winter.

X Ques. 3. Was the relative cost of the two teeth mentioned the same both times you figured it?

Ans. Yes, sir.

X Ques. 4. What is the cost of manufacturing the cast-iron work of tooth No. 3?

Ans. Can't prove the cast-iron work by me.

X Ques. 5. Why not?

Ans. My work is wrought-iron.

X Ques. 6. What is the cost of the wrought-iron work in tooth No. 3?

Ans. A cent and a half a piece for the work.

X Ques. 7. What is the cost of the wrought-iron material of tooth No. 3?

Ans. I don't know.

X Ques. 8. When you speak of the comparative cost of the two teeth mentioned, do you then speak entirely from your own knowledge?

Ans. I do.

X Ques. 9. Then tell me the cost of the cast-iron part of the two teeth.

Ans. I do not know about the cast-iron.

X Ques. 10. Do you know the cost of the wrought-iron material?

Ans. I do not know the cost of the material.

X Ques. 11. In the calculations you have made of the com-
91 parative cost of the teeth mentioned, was it based on a similar tooth in size to the one marked No. 3?

Ans. It was.

X-Ques. 12. Does the Appleton Manufacturing Company make different sizes of the tooth marked No. 3, shown in evidence?

Ans. They do not for their seeders.

Re-examination:

Re-ex. Ques. 1. Who is superintendent of your shops?

Ans. G. D. Rowell.

Re-ex. Ques. 2. Who furnished you the cost of the iron and steel when you made the calculation?

Ans. The Appleton Manufacturing Company.

Re-ex. Ques. 3. Who furnished the cost of the cast iron?

Ans. The Appleton Manufacturing Company.

Re-ex. Ques. 4. Do you use the same amount of steel in each tooth?

Ans. We do.

Re-ex. Ques. 5. Do you use any cast iron in tooth No. 2?

Ans. We do not.

Re-ex. Ques. 6. What is the cost or difference in the amount of labor in the shop of making tooth No. 2 and tooth No. 3?

Ans. We got out on an average from 80 to 85 a day to the hand of tooth No. 2; we got out on an average from 100 to 120 a hand of tooth No. 3.

Re-ex. Ques. 7. How many bolts do you use in No. 2 to hold it to drag-bar?

Ans. Two.

Re-ex. Ques. 8. How long is it since you made teeth like tooth No. 2?

Ans. Two years this fall.

Re-ex. Ques. 9. Who assisted you, if any one, in estimating the cost?

Ans. G. D. Rowell.

Re-ex. Ques. 10. Can you, at the noon adjournment, furnish the figures of the cost of the teeth?

Ans. I can.

By consent of parties adjourned until 2 o'clock p. m.

TWO O'CLOCK P. M.

Parties met pursuant to adjournment, as before.

Re-ex. Ques. 11. Have you made an estimate of the kind of labor and amount in making tooth No. 2 per hand for a day's work? If so, please state it.

92 Ans. I have; in welding the steel on to the tooth and shaping the tooth a hand will average 80 per day; in welding the brace on to the standard a hand would average 135 per day; bending the brace, one hand would average 400 per day.

Re-ex. Ques. 12. What is the weight of the wrought iron and what is the weight of the steel?

Ans. The wrought iron is three and three-quarter pounds and steel half a pound.

Re-ex. Ques. 13. What is the weight of the iron and steel in tooth No. 3?

Ans. The iron is three pounds and steel half a pound.

Re-ex. Ques. 14. What is the labor making that tooth per hand?

Ans, Welding on steel will average 110 to 120 a hand per day.

Re-ex. Ques. 15. In punching and shaping is there any difference between Nos. 2 and 3?

Ans. There is not; they are both alike.

Re-ex Ques. 16. Do you know what the company estimates the cost of this labor per hand, including tools, shop room, other necessary expenses, and wages?

(Objected to by complainants' counsel, as hearsay.)

Ans. Two dollars and a half per day.

Re-ex. Ques. 17. Do you know what the cost of iron is estimated at?

Ans. Two cents a pound.

Recross-examination:

ReX-ex. Ques. 1. When you state the iron in No. 3 weighs three pounds, do you include the wrought and cast iron?

Ans. I include the wrought iron only.

ReX-ex. Ques. 2. Do you know how much the cast iron weighs?

Ans. I do not.

ReX-ex. Ques. 3. Do you know what the cost of a cast-iron plate in tooth No. 3 is?

Ans. I do not.

ReX-ex. Ques 4. Do you know what the total weight of tooth No. 3 is?

Ans. I don't know.

ReX-ex. Ques. 5. Which tooth do you consider the heavier, No. 2 or 3?

Ans. I think No. 3 is the heavier.

93 ReX-ex. Ques. 6. Do you know of your own knowledge that the cost of iron is two cents a pound, or did you derive your knowledge from some third party?

Ans. I know the iron is two cents a pound.

ReX-ex. Ques. 7. Do you know of your own knowledge that $2.50 is a correct estimate of a day's labor in the shop, as stated by you?

Ans. I do.

ReX-ex. Ques. 8. Give us the computation by which you arrive at this estimate.

Ans. We pay a man $1.50 per day; we conclude that iron, coal, steel, &c., will amount to another dollar; this makes $2.50.

ReX Ques. 9. Then you guess that coal, iron, &c., amounts to $1 a day?

Ans. I don't guess, but know.

ReX Ques. 10. Give us the figures for cost of coal, iron, &c.

Ans. Labor, $1.50 per day; coal, tools, borax, &c., $1—$2.50.

ReX Ques. 11. Is this as correct an estimate as you can give?

Ans. Yes, sir.

ReX Ques. 12. How many bolts does No. 2 take and how many does No. 3 take?

Ans. No. 2 takes two bolts and No. 3 1.

F. EDWARD SAKER.

D. J. WOODWARD, being duly cautioned and sworn, says:

(Complainants, by counsel, object to the examination of this witness, on the ground that no notice was given in the answer of the name of the witness, under the statute requiring such notice to be given.)

Q. 1. What is your name, age, place of residence, and occupation?

A. D. J. Woodward; age, 51 years; Appleton, Outagamie county, Wisconsin.; occupation, am secretary of the Appleton Manufacturing Company.

Q. 2. How long have you been connected with that company?

A. About four years now.

Q. 3. Did your company formerly pay J. S. Rowell & Sons a license for manufacturing slip teeth for seeders?

A. It did.

Q. 4. Look at the exhibits marked Appleton Tooth No. 1, Appleton Tooth No. 2, and Appleton Tooth No. 3. Were any of those the kind upon which you paid royalty?

A. Yes; on Nos. 1 and 2.

Q. 5. Has he ever made any claim on you for royalty on No. 3?

(Objected to, as immaterial.)

94 A. Not that I know of.

Q. 6. Which tooth gives most satisfaction to the farmers, and why, Exhibit No. 3 or those like Nos. 1 and 2?

(Objected to, as immaterial.)

A. No. 3, we claim; the weight in end of bar causes it to run steadier and deeper in ground; I have reference to the casting at upper end of bar attached to the tooth.

Q. 7. Have you ever had to furnish new teeth for seeders having teeth like Exhibits Appleton Nos. 1 and 2 within the last two years? If so, what kind of teeth are preferred by the farmers to replace the others?

(Objected to, as immaterial.)

A. We have furnished one set that I am positive of; Mr. G. D. Rowell knows better about the number than I do; in one case a man would not settle with me unless I put in a set of No. 3 teeth, and I did so; he complained the others didn't run deep enough.

Q. 8. What are the figures on the side of the cast-iron plate of tooth No. 3?

(Objected to, as immaterial.)

A. We claim it an advantage in adjusting the teeth alike.

Q. 9. How do the farmers regard this feature?

(Objected to, as immaterial.)

A. They claim it as an advantage, the same as we do; always talked it that way to us.

Q. 10. What did your company pay Mr. Rowell for license fee per seeder on those having teeth like Nos. 1 and 2?

(Objected to, as immaterial.)

A. We paid them $1 for each seeder manufactured.

Q. 11. How many teeth have you been in the habit of manufacturing per seeder?

A. Eleven teeth, usually; have made some more of late.

Cross-examination:

Q. 1. When did your company stop manufacturing tooth No. 1?

A. I don't know.

Q. 2. When did your company stop manufacturing tooth No. 2?

A. In the spring of 1877.

Q. When did your company commence manufacturing tooth No. 3?

A. We tested the tooth, I think, in the spring of '77; we put in a few set before we commenced manufacturing; commenced manufacturing in fall of '77.

95 Q. 4. Were your company licensed by J. S. Rowell to manufacture tooth No. 1 or 2, or both?

A. I think there is nothing in our license stating where we shall set the brace; only that we shall manufacture Mr. Rowell's slip tooth.

Q. 5. Do you consider it material, under the license, where you put the brace?

A. I consider it necessary to put the brace where it is on No. 2; near the steel point.

Q. 6. Did you ever see the patent and specifications?

A. I have.

Q. 7. Does the specifications say anything about putting the brace where you have designated?

(Objected to.)

A. I can't say whether it does or not, but I consider it necessary.

Q. 8. Have your company a patent for tooth No. 3?

A. We have.

Q. 9. How many machines having teeth like tooth No. 3 has your company manufactured?

A. Some seven hundred or more.

Q. 10. In what section of the country have they been sold principally?

A. In Wisconsin, Illinois, Minnesota, and Dacotah Territory.

Q. 11. Where does this man live you replaced the teeth for?

A. In the town of Ellington, in this county.

Q. 12. What is his name?

A. Adam Weiland.

Q. 13. What is the soil of his farm?

A. Heavy clay soil.

Q. 14. When you speak of your seeder being better adapted for deep cultivating, on account of the heavy plate on end of beam, do you not especially refer to heavy soils?

A. Yes, sir; I do.

Q. 15. Then you consider, do you, it not of so much advantage in light soils?

A. The other tooth would answer in light soils.

Q. 16. Did not your company agree, in the licenses you speak of from Rowell, to pay a license fee of $2.50 per machine?

A. It did; but there was a discount of sixty per cent to be deducted if paid when due.

Q. 17. Were there not other conditions in the license upon the performance of which the company were to have the sixty per cent. discount besides paying when due.

96 (Objected to. The license itself is the best evidence of its conditions, or a copy. Counsel is willing that a copy should be attached, to be used the same as the original.)

A. There were.

Q. 18. How many teeth do you put in your machines?

A. Eleven and twelve; we made a few thirteen, I think.

D. J. WOODARD.

G. D. ROWELL, being duly cautioned and sworn, says:

(Same objection made to this deposition as to the others.)

Q. 1. What is your name, residence, age, and occupation?

A. G. D. Rowell; Appleton, Outagamie county, Wisconsin; my age is 44; my occupation, am superintendent of Appleton Manufacturing Company.

Q. 2. How long have you been engaged in manufacturing seeders at that establishment?

A. Something over four years.

Q. 3. Dook at Appleton Tooth No. 1. Were seeders made at your works containing slip teeth like that. If so, how long did you make them?

A. There were; the first we made; we made 100 to 150 like No. 1. Then we made some with a lock in like ours. One with lock in was not like tooth No. 3.

Q. 4. Did you manufacture seeders like No. 1 more than one season?

A. Don't think we did; might have made a few another season.

Q. 5. Look at Appleton Tooth No. 2. Was it made at your shop? If so, were seeders made like that after or before you made them like No. 1?

A. We made seeders like that; it was after we make them like No. 1.

Q. 6. Why did you change the location or point of attachment of the brace to the shank of the tooth from that shown in tooth No. 1 to the form of that of tooth No. 2?

(Objected to, as immaterial.)

A. We changed it to strengthen the standard. We had some trouble with the tooth bending between the top of the steel and lower part of the brace.

Q. 7. Look at Appleton Tooth No. 3. Have you made teeth like that; if so, how many seasons have you made them?

A. We have made them two seasons.

Q. 8. In practice are there any advantages or difference between the two; if so, which gives the best satisfaction, and why?

97 A. No. 3 has no brace; the other has. The one having no brace gives a greater space for clearance from cornstalks and any rubbish; besides, we do away with the welding of brace, and have figures on top of head for showing exact positions in which it is set. Aside from that we do away with one bolt, making it a superior tooth, I think, to any tooth in the market. By using the cast-iron head we can give weight directly over the tooth and double friction front and back of center of tooth.

Q. 9. Does the weight of iron plate affect the running of the tooth; if so, in what way?

A. It does; by holding it down in the ground in certain positions and making it run steadier.

Q. 10. What does this cast-iron head weigh?

A. Weighs from three pounds and three to four ounces.

Q. 11. I understand that this amount of weight is put in partly to make the tooth run steadier and deeper; is it necessary to put in

all this amount of iron for the simple purpose of fastening the tooth in position?

A. No, sir; it is not.

Q. 12. In making a cultivator tooth, do you vary the weight of this cast-iron head?

A. I do not think it is half as heavy for cultivators as it is for seeders.

Q. 13. State, if you can, the cost of making the tooth-head and bolts of No. 3 as compared with cost of tooth No. 2 and its bolts.

A. The cost is about the same.

Q. 14. Have you made the estimates to determine this; if so, how many times?

A. Two different times; we went through and made regular estimates the best we knew how soon after we got the patent, or about that time; made the first then and made another about one year ago.

Q. 15. Are the teeth of the seeder set on same line from front to rear, or are they set zig-zag, or on what is called two ranks?

A. They are set in two ranks?

Q. 16. What distance apart are the ranks?

A. I should say about ten inches.

Q. 17. What is the width of an 11-tooth machine from axle to axle?

A. I think six feet.

Cross-examination:

Q. 1. Have you the estimates here on which you compute the respective costs of these teeth?

A. I haven't got them exact.

Q. 2. Were the two estimates referred to about the same?

A. Yes, sir.

98 Q. 3. How much difference?

A. I don't think there was over half a cent either way.

Q. 4. Is not iron and labor enough cheaper, when you made the second estimate from the first, to make more than that difference in the two estimates?

A. Iron is, I think, a trifle cheaper now; labor is about the same.

Q. 5. Is it any advantage to have the additional weight of your head plate, except in heavy soils?

A. I consider it an advantage in all soils.

Q. 6. How much additional weight does this head plate make on a seeder of thirteen teeth over a seeder of the Rowell tooth?

A. About twenty-five to thirty pounds.

Q. 7. How much does a seeder of thirteen teeth, using Rowell teeth, weigh?

A. Can't state.

Q. 8. Is not Appleton Tooth No. 2 made in accordance with the Rowell patent in controversy?

A. I should say it was; moving the brace up or down a little wouldn't change it in the patent line.

Q. 9. You have stated you have changed the brace from No. 1 to No. 2, so as to prevent the standard from bending, have you not?

A. Yes, sir.

Q. 10. Why will not the standard of your tooth bend when meeting obstruction, it having no brace?

A. It is made of larger iron.

Q. 11. How is Appleton Tooth No. 3 adjusted and fastened to the drag-bar; explain fully?

A. We slot the bar and secure it by a friction head-bolt, passing through the center.

Q. 12. In what form is the slot in the bar?

A. It commences from the rear end, and saw in ten to fourteen inches a slot the thickness of the tooth-head.

Q. 13. Is the slot cut to the end?

A. It is.

Q. 14. How is there any more chance for clearing obstructions with tooth No. 3 than there is with tooth- No. 1 or 2?

A. For the reason that there is no brace on tooth No. 3 upon which stuff collects setting in two ranks; the brace of No-. 1 and 2 of the front rank practically closes the space between the two ranks.

Q. 15. Do you state that stubble will collect in seeders using teeth Nos. 1 and 2?

99 A. Yes, I think so.

Q. 16. Will it not collect on tooth No. 3?

A. Not as quick; I don't say but they can't be clogged.

Q. 17. Is not Appleton Tooth No. 1 made in accordance with the Rowell patent?

A. I think it is.

Q. 18. What is the cost of the head plate in tooth No. 3?

A. About six cents.

Q. 19. Is your company interested in the result of the suit in which this deposition is taken?

A. No, sir.

Q. 20. Don't you think, if the defendant succeeds, it will affect you favorably?

A. I cannot see how it can.

Q. 21. Have you been sued by the plaintiffs for the infringement of this patent?

A. Not on the slip tooth, that I know anything about; was sued on a license of a combined machine.

G. D. ROWELL.

Counsel for defendant now offers in evidence the several exhibits, marked respectively, "Appleton Tooth No. 1," "Appleton Tooth No. 2," "Appleton Tooth No. 3," and requests the officer to sign his name to the same for the purpose of identification.

United States District Court, Eastern District of Wisconsin. In Equity.

JOHN S. ROWELL and IRA ROWELL
vs.
EDMUND J. LINDSAY and WILLIAM LINDSAY.

Testimony in reference, under rule 67, in equity. Before Francis Bloodgood, Examiner in Chancery.

MILWAUKEE, *August 23d*, 1879.

Present, pursuant to notice: For the complainants, Messrs. A. R. R. Butler and James J. Dick; for the defendants, E. E. Wood, Esq., of Cincinnati.

Defendants' Testimony.

M. C. GOUCHER, being sworn, testified:

Q. 1. Your age and residence.

A. Thirty-two; residence, in Milwaukee.

100 Q. 2. What business are you engaged in?

A. Selling agricultural implements.

Q. 3. What kind of agricultural implements?

A. I am selling at wholesale the Superior seeders and drills and Thomas' horse rakes, Thomas' portable engines, Victor mowers, hay forks, and hay carriers, and am selling at retail a full line of agricultural implements, from here to St. Paul.

Q. 4. How long have you been engaged in manufacturing and selling agricultural implements?

A. Twelve years.

Q. 5. Have you been connected with a factory, superintending the manufacture and directing how they should be made?

A. I was; was partner in a manufacturing concern for seven years at Ashland, Ohio.

Q. 6. How long have you been engaged in selling seeders in this State?

A. Two years.

Q. 7. State the nature of your business employments; what facilities you have for becoming acquainted with the different kinds of seeders in use.

A. I have a general agency for this State, Minnesota, and Dakota for the Superior seeder, to sell it at wholesale, and naturally meet people with machines in competition.

Q. 8. State whether you travel around the State, visiting fairs, &c.

A. I do visit fairs—district fairs and fairs of the different States—and visit all the principal towns for the purpose of locating agencies in the two States; also, in the Territory of Dakota.

Q. 9. When you visit towns you see and come in contact with different seeders?

A. I do.

Q. 10. Are you acquainted, by reputation and otherwise, with the Rowell slip tooth and beam, like exhibit marked "Plaintiffs' Tooth and Beam," now shown you?

A. Yes, sir.

(Plaintiff objects to the testimony of this witness being now taken, for the reason that the name and residence of the witness is not given in the answer of the defendants, nor any notice of the same in the answer given under the statute which requires such notice to be given.)

Q. 11. Look at the device now shown you marked "Defendants' Tooth and Beam." What is the name by which it is known in the market?

A. The name of the seeder?

Q. 12. Yes, sir.

A. The Superior seeder.

101 Q. 13. And the one you sell?

A. Yes, sir; the one I sell.

Q. 14. Of whom does Lindsay obtain his seeders?

A. Of Thomas, Ludlow & Rodgers.

Q. 15. Does he purchase them directly?

A. He purchases them through me.

Q. 16. Look at the device marked "Appleton Tooth No. 3," now shown you. By whom was that device manufactured?

A. Manufactured by the Appleton Manufacturing Company, Appleton, Wisconsin.

Q. 17. Look at this tooth and beam now shown you, and state, if you know, who manufactures that?

A. The Depere Agricultural Works, at Depere, Wisconsin.

Q. 18. Look at this tooth and beam now shown you and state, if you know, who manufactures that.

A. P. P. Mast & Co., of Springfield, Ohio.

Q. 19. Look at this device now shown you. Who manufactures that?

A. My impression is that is the Harris, but I am not sure between that and this one.

Q. 20. Who manufactures this one?

A. I will give the same answer in regard to that; I am not sure which is made by Harris & Co., of Janesville, and which by George Esterly & Co., of Whitewater.

Q. 21. Now state, as nearly as you can, the number of seeders manufactured by the different firms making such seeders, as nearly as you can estimate.

A. My estimate would be from eight to ten thousand; no, from ten to fourteen thousand annually.

Q. 22. Have you that list that you gave me yesterday?

A. Yes, sir.

(Witness produces list.)

Q. 23. Won't you give the names of the different firms and their places of business, who manufacture seeders, so far as you know?

A. The Depere Agricultural Works, Depere, Wisconsin; the Appleton Manufacturing Company, Appleton, Wisconsin; Van Brunt & Barber, Horicon; Van Brunt & Davis, Horicon; Agricultural

Company, Lake Mills, Wisconsin; Harris Manufacturing Company, Janesville, Wisconsin; Utter & Co., or the Gorham, Rockford, Ill.; George Esterly & Son, Whitewater, Wisconsin; J. P. Williams, Kenosha, Wisconsin; P. P. Mast & Co., Springfield, Ohio; Thomas, Ludlow & Rogers, Springfield, Ohio; J. S. Rowell & Son, Beaver Dam, Wisconsin; Fond du Lac Wheel and Seeder Company,
102 Fond du Lac, Wisconsin; Hoosier Drill Company, Richmond, Indiana; D. E. McSherry, Dayton, Ohio. From 10,000 to 14,000 made by the companies I have enumerated.

Q. 24. What name is the Rowell tooth known to the trade by?

A. Well, it is known both as the Rowell slip tooth and as belonging to the class of tooth with brace—brace tooth.

Q. 25. Is there a class of tooth manufactured which are known to the trade as having no brace?

A. Yes, sir.

Q. 26. Won't you enumerate the firms; point out the teeth shown you, so far as you can, which are known to the trade as teeth having no brace?

A. Depere Agricultural Company, no brace; Appleton Manufacturing Company, no brace; I don't know whether the Harris or Esterly, one or the other, has no brace; Williams' Seeder, of Kenosha, no brace; P. P. Mast & Co., no brace; Hoosier, no brace; McSherry, no brace; the Gorham, made by Utter & Co., of Rockford, Ill., no brace; Thomas, Ludlow & Rodgers, no brace.

Q. 27. How do the number of seeders made without brace, sold, compare, as nearly as you can give it, with the number made with brace?

A. Well, taking my estimate as the standard, I should say there were 1,000 or so more made without brace than with brace.

Q. 28. In the two years that you have been handling the Superior or defendants' tooth, what has been said, if anything, by the user and agents you have traded with regarding the question of the bending or breaking of the tooth?

(Objected to.)

Q. 29. State whether or not the teeth have bent or broken, and give the causes?

A. I have had numerous complaints from the agents and farmers as to the tooth bending in the shank, especially where there is a clay soil.

Q. 30. What has been said, if anything, in regard to that?

(Objected to.)

A. The complaint has been raised that the teeth bend in heavy soil on account of its not being braced, and the question has been frequently asked me why we did not brace our tooth to prevent this bending in heavy soil, or twisting, rather.

Q. 31. Whereabouts in the shank does this bending usually occur?

A. Well, immediately below the junction of the tooth and the drag bar.

Q. 32. How is the strain which comes upon the point of the tooth imparted to the drag bar in the Rowell, or plaintiffs', tooth and beam?

A. Through the bars—braces.

Q. 33. How is it with the defendants', Superior, tooth and beam?

A. In the shank.

103 Q. 34. Is there anything in that device for making it operate in the manner like Rowell's?

A. There is not.

Q. 35. Now, with reference to the action of the tooth in the act of slipping over an obstruction, do these two teeth operate in the same manner; if any, explain the difference in the action of the teeth in passing through the slot?

(Objected to.)

A. I should say that they did not operate in the same way. The difference in the operation consists in the complainants' tooth and brace passing endwise through the slot in the drag bar, while in the defendants' the shank passes through the drag bar in a circle.

Q. 36. Does not this in any way affect the character of the tooth; if so, in what way?

A. It does affect it, in that in the complainants' device the brace is liable to wear a groove or crease in the wood where it touches the brace, which is not liable to occur in the defendants' device. The wearing of this crease in the wood causes the liability of the tooth to slip when it ought not to.

Q. 37. Which, in your opinion, is the most durable as to wearing the slot?

A. The defendants' device.

Q. 38. Is there any result accomplished by the peculiar location of the rear bolt in the defendants' device?

A. Yes, sir; they are thereby enabled to align.

Q. 39. In a full-sized seeder, what, if anything, do the iron ears upon the front of the bar abut against?

A. I don't think I understand the question.

Q. 40. How much space is there between those ears?

A. Latterly?

Q. 41. Latterly.

A. None.

Q. 42. They come close together?

A. Yes, sir; the iron ears abut against each other.

Q. 43. Which of these two seeders, the defendants or complainants, if either, operate most satisfactory in trashy ground?

(Objected to.)

A. The defendants, for the reason of their not having any brace. They don't collect the corn-stalks and other trash that accumulates.

Q. 44. Do you, or do you not, consider this a material advantage?

A. I do consider it an advantage.

104 Q. 45. State what means, if any, were taken to overcome

the objection to the bending of the teeth at the shank below the drag-bar.

A. The iron has been strengthened; or, in other words, the shank has been made stronger, iron thicker, and heavier.

Q. 46. Which do you consider the more preferable tooth for sale and use in your territory; the one made like defendants' or the one made like complainants'?

A. Well, sir, they each have their advantages, for the reasons I have given before.

Q. 47. Which do you consider the most preferable?

A. I consider the defendants'.

Cross-examination:

X Q. 1. Did you ever know of the defendants' tooth clogging?

A. I have never seen it clog.

X Q. 2. These teeth are set in two ranks?

A. Yes, sir.

X Q. 3. How far apart are they?

A. About six inches; you mean the two ranks; between six and eight inches, I should think.

X Q. 4. Will you explain how the rear bolt in defendants' tooth enables them to align the teeth?

A. I can explain it by the drag bar.

X Q. 5. Explain it, so that we can get it put down?

A. The distance from the front bolt to the rear bolt being always the same, and the distance from the front point of the shank to the point where it passes downwards through the drag bar being always the same; when the front edge of the shank touches the rear bolt the same angle always obtains.

X Q. 6. Is not the distance in the plaintiffs' tooth from the point of the attachment to the bar always the same, or nearly so—practically the same?

A. I should think not.

X Q. 7. How much does it vary?

A. In this one about half an inch.

X Q. 8. In what distance?

A. In the working distance; it varies at the top half an inch; at the bottom three or four inches.

X Q. 9. Bottom of what?

A. Of the tooth. I claim that the difference is this: That the rear bolt does not align the teeth; it has nothing to do with aligning the teeth; when it is in position it is always against the rear bolt.

105 X Q. 10. Is the defendant's tooth always against the rear bolt in whatever position the tooth is set?

A. Yes, sir; for the reason that we change the position of our tooth by shortening the chains. If this tooth slips back out of place, of course it does not align.

X Q. 11. Then I understand you that you put your tooth in place by putting it against the rear bolt?

A. Yes, sir.

X Q. 12. Then I understand you that you do not align your teeth by changing the tooth against the bolt?

A. I don't understand the question.

X Q. 13. After you once set your tooth against the bolt, do you change your tooth with respect to the bolt?

A. No, sir.

X Q. 14. Do you claim to set your tooth to run deeper or shallower by raising or lowering the teeth; changing the position of them against the bolt?

A. We set them to run deeper or shallower by raising or lowering them by chains, not by changing the position against the bolt.

X Q. 15. Do you claim to set your tooth to run deeper or shallower by setting your teeth upwards or forwards?

A. By raising the chains we raise the teeth upward and backward.

X Q. 16. Answer my question directly. Do you set your tooth to run deeper or shallower by setting your tooth upwards or forwards?

A. We do; but we do it with chains.

X Q. 17. Not by setting the teeth?

A. Not by changing them in the slot, or changing the position against the bar.

X Q. 18. Then I understand you you don't set your teeth with respect to the bolt?

A. Not with respect to the bolt; no, sir.

X Q. 19. Then tell me in what respect the bolt has to do with setting your teeth to run deeper or shallower?

A. Nothing to do with it. It has nothing to do with it only to align the teeth when they are first put in.

X Q. 20. Can you not, with the complainant's device, tooth and beam, set the teeth so as to run deeper or shallower by merely loosening the bolt, and changing the position of the teeth?

A. By loosening the bolt and changing the position of the teeth here, do you mean?

X Q. 21. That is the only way you can, I suppose?

A. Yes, sir; I should think we could.

106 X Q. 22. State whether or not the defendant's tooth, where it passes through the drag bar, is or is not on the curve?

A. The defendant's tooth as it passes through the drag bar?

X Q. 23. Yes, sir.

A. The tooth is curved; yes, sir. The brace is curved. The defendant's tooth? I beg your pardon. I have it mixed; whether the defendant's tooth, as it passes through the brace is on a curve.

X Q. 24. When it passes through the bar I said.

A. Yes, sir; it is.

X Q. 25. Can you state what angle the curve is?

A. No, sir; I can not.

X Q. 26. State whether in the plaintiff's device, tooth and beam, the brace, where it passes through the bar, is on a curve?

A. It is on a curve.

X Q. 27. Can you state what kind of a curve it is?

A. No, sir; I cannot.

X Q. 28. Are the curves in the respective teeth. The plaintiff's and defendant's substantially the same?

A. I think not.

X Q. 29. What is the difference?

A. The difference in the curve. The result of the different curves.

X Q. 30. I am not speaking about the result. Answer the question. Are the curves in the respective teeth, plaintiff's and defendant's, substantially the same?

A. I should think not.

X Q. 31. What is the difference in the curve of the two teeth, as to their shape?

A. I could not state as to their shape what the difference is.

X Q. 32. As to the shape, is the difference very great?

A. Not very great.

X Q. 33. Do you call the curved part of defendant's tooth a brace?

A. I do not.

X Q. 34. What do you call it?

A. I call it a part of the shank.

X Q. 35. Does it not operate as a brace?

A. It does not.

X Q. 36. Why not?

A. For the reason that the upper curve gives it no additional strength, and for the further reason that the strain in the defendant's tooth, on the point of the tooth, will finally terminate at the junction of the shank and the lower edge of the drag bar.

107 X Q. 37. Did you ever know of the plaintiff's device having worn to such an extent that it would not hold the teeth in position in the slotted beam?

A. I has been from information that I know.

X Q. 38. I ask you if you know.

A. I have never seen one; no, sir.

X Q. 39. Both of these devices have the slotted beam similar?

A. Yes, sir.

X Q. 40. The plaintiff's and defendants?

A. Yes, sir.

X Q. 41. As both devices, plaintiff's and defendants, have the same slotted beam, and the teeth substantially where is passes through on the same angle as you have stated, why would there be any more wear in the plaintiff's device to the slot than in the defendant's?

A. I did not state they were substantially the same angle, and the reason there would be more wear in the plaintiff's than in the defendant's is, that the defendant's teeth in passing through the slot pass through at right angles with the length; that the tooth slips right back from the whole broad surface of the slot, while in the plaintiff's it slips up through.

X Q. 42. Then I understand you to say that your reason is because the iron in the defendant's tooth passes over more surface in slipping than the other?

A. Yes, sir; that is it exactly.

X Q. 43. How much more?

A. I could not say.

X Q. 44. State as nearly as you can.

A. The defendant's passes over all there is.

X Q. 45. How much is there?

(Witness measures.)

A. About three inches square.

X Q. 46. You base your assertion on the fact that the plaintiff's tooth passes directly up through the bar perpendicularly, do you?

A. I base my assertion on the fact that the plaintiff's tooth does not pass over as much wood surface as the defendant's.

X Q. 47. Did not you just now state that the plaintiff's tooth passed directly up through the slotted bar?

A. I said it passed endways through the bar, while ours passed through at right angles.

X Q. 48. What do you mean by "endways" at right angles with the bar, or perpendicularly with the bar?

A. I mean that it passes through in such a manner that
108 almost the same portion of the drag bar impinges upon the brace of the tooth at all angles.

X Q. 49. What do you mean by "almost?"

A. I mean that it does not pass over as much wood surface as it does in the defendant's.

X Q. 50. What extent does it pass over less?

A. The exhibit will show.

X Q. 51. I want your opinion. In your opinion how much less extent does the plaintiff's pass over the wood than the defendant's?

A. I cannot give the exact difference.

(Witness shown plaintiff's device.)

X Q 52. Then the plaintiff's tooth passes through the drag bar on a curve?

A. It passes through endways; yes, sir, on a curve; it passes through endwise.

X Q. 53. From the rear portion of the tooth to the end of the brace, what is the distance?

A. In the plaintiff's?

X Q. 54. In the plaintiff's?

A. About one and a quarter inches.

X Q. 55. Is not it an inch and a half?

A. I should say an inch and a half.

X Q. 56. Does not the plaintiff's tooth pass through the entire rear portion of the plaintiff's device shown you?

A. Nearly so; yes, sir.

(Witness shown defendant's device.)

X Q. 57. How far is the back end of the tooth from the end of the bar in the defendant's device?

A. About the same distance.

X Q. 58. In the practical working of the teeth, how far will the teeth pass toward the end of the brace of the bar?

A. It passes clear out.

X Q. 59. Then, in one case the tooth does not pass over any more wood than in the other, does it, in passing out.

A. The difference in these exhibits is not material.

X Q. 60. If you don't care to answer the question, I will repeat it in this form: Does not the tooth in the complainant's device pass over as much wood space in passing out of the bar as it does in the defendant's?

A. We have to look at the teeth; no, sir, it does not.

X Q. 61. How can the tooth pass over more wood space in
109 defendant's device than it can in the plaintiff's device, when the distance of wood is the same that it passes over?

A. In the defendant's device the distance that is passed over by the tooth is not only the distance from the rear bolt to the end of the bar, but the distance of the upper half of the drag-bar from the rear bolt to the front bolt.

X Q. 62. But have you not said that the holding power of the defendant's device, when you were speaking of the tooth not bending, was back of the rear bolt?

A. I think I did not state that; not that I remember.

X Q. 63. Is it not so?

A. I can't answer that question; I should say it was no more behind than before.

X Q. 64. If it is so, does the amount of the wood that the tooth passes over in the bar in front of the rear bolt have anything to do with the amount of wood the tooth passes over for wearing purposes?

A. I should say that if it was so, there was no difference. I will amend that answer. I say there would be a difference even in that case.

X Q. 65. Is not the defendant's tooth liable to wear a crease in the wood?

A. I have never known it to do so; no, sir.

X Q. 66. Is not the defendant's tooth liable to wear a crease in the wood?

A. I will answer that as fully as I can. I have never known it to do so.

(Witness shown the plaintiff's device.)

X Q. 67. Work the tooth in the bar and show us where the crease in the wood would be that you speak of; what its form would be?

A. I have stated before that I have no knowledge of it myself, that it was only from information received; consequently, I am not prepared to state where the crease would be, not having seen them.

X Q. 68. Is there any reason why the defendant's tooth, striking an obstruction and not giving way, should be bent?

A. None that I know of, sir.

X Q. 69. Is it not possible that it would be bent in practical operation?

A. The defendant's tooth?

X Q. 70. Yes, sir.

A. Such has been the complaint; yes, sir.

X Q. 71. Would it not obviate, to a great extent, this objection to the defendant's tooth if it was braced?

A. That is the general impression; yes, sir.

110 X Q. 72. A sufficient amount of rubbish in the ground in which the defendant's tooth was operated would cause it to clog, would it not?

A. I have not heard the complaint.

X Q. 73. I am not asking about the complaint, I am asking about the fact. A sufficient amount of rubbish in the field where the defendant's tooth was operated might cause it to clog?

A. I have never seen the field cultivated in which it would clog.

X Q. 74. Never have seen one?

A. No, sir.

X Q. 75. Have you had much experience in farming?

A. No, sir; not very much.

X Q. 76. You call the Appleton tooth a no-brace machine?

A. Yes, sir.

X Q. 77. Has not the Appleton tooth, marked Appleton tooth No. 3, practically a brace?

A. I should say not.

X Q. 78. Where is the point of attachment in the Appleton tooth to the bar?

A. Where is the point of attachment to the bar?

X Q. 79. Yes, sir.

A. At the bolt.

X Q. 80. How far does the head-plate pass downward along the tooth to the point of attachment?

A. I could not tell without measuring.

X Q. 81. Get at it as nearly as possible.

A. About two and three-quarter inches from the center of the bolt forward to the rear side of the tooth.

X Q. 82. Does not, in your opinion, this head-plate act in the same manner as a brace to the tooth?

A. No, sir; I don't think it does.

X Q. 83. What holds the Appleton tooth in position?

A. The friction of the sides of the beam pressing against the shank of the tooth and the head bolt.

X Q. 84. What prevents the tooth from passing forward or upwards?

A. The friction.

X Q. 85. Does not the form of the head-plate have anything to do with it?

A. The head-plate is held in position by the friction of the bar; that is my understanding why the head-plate is put in, to give more surface for friction.

X Q. 86. Then, if the head-plate was in different form, but
111 of the same size, bearing on the bar, giving the same amount of friction, the teeth would be held in position passing upwards and forwards as well as in the present form?

A. It would do so, no matter what the form was, if the plate was

of such form that the teeth must move with it. In other words, if the head plate was wedded fast to the teeth and projected forward, not having any rear arrangement, but having the same frictional surface, it would hold it just as well as it does now.

X Q. 87. Does not the form of the plate add to the strength of the tooth?

A. I should say not.

X Q. 88. Suppose there were no head plate in connection with the Appleton tooth, would the tooth keep in the position in which it stands as readily as it does now?

A. No, sir; it would not.

X Q. 89. Then you say that the head plate of the Appleton tooth in no wise operates as a brace to the tooth?

A. That is my understanding; yes, sir. Wait, I want to make a correction. It in no way operates as a brace in so far as the head plate projects below, behind the shank, thereby bringing the point point where the strain terminates, that much below the edge of the dragbar.

X Q. 90. Then, in some respects, the Appleton is a braced tooth?

A. Just in the respects which I have stated.

X Q. 91. What do you call this?

(Witness shown device.)

A. That is the P. P. Mast & Co. beam and tooth.

X Q. 92. You have stated that the P. P. Mast & Company's was not a braced tooth, have you not?

A. Yes, sir.

X Q. 93. Is not that, to a certain extent, a braced tooth?

A. I should think not.

X Q. 94. Is it not as much as the Appleton tooth, to the same extent, at least?

A. No, it is not; it does not project in the rear at all. My statement was, inasmuch as this projected in the rear of the tooth.

(Witness shown device.)

X Q. 95. What is this?

A. That is the Depere tooth and beam.

X Q. 96. You have stated, have you not, that the Depere was not a brace?

A. Not a brace; yes, sir.

X Q. 97. Do you still hold to that opinion?

112 A. I still hold this opinion, that neither the Depere nor the Appleton has a brace.

X Q. 98. To no extent whatever?

A. To no extent whatever.

X Q. 99. What is this?

A. That is the Gorham.

X Q. 100. You have stated that the Gorham was not a braced tooth, have you not?

A. Yes, sir.

X Q. 101. Do you still hold to that opinion?

A. I do.

X Q. 102. How many machines has the Depere Company probably made annually?

A. From three to five hundred.

X Q. 103. How many has the Appleton Company made?

A. About seven hundred.

X Q. 104. You have stated there were from ten to fourteen thousand seeders made annually?

A. Annually; yes, sir.

X Q. 105. The DePere Company manufactures from three to five hundred annually?

A. Annually; yes, sir.

X Q. 106. The Appleton Company seven hundred annually?

A. No, sir, not annually. They have made about four hundred this year, and the Harris M'f'g Co., under my estimate, about five hundred.

X Q. 107. J. P. Williams?

A. Two or three hundred.

X Q. 108. How many have Mast & Co. manufactured?

A. About fifteen hundred.

X Q. 109. Thomas, Ludlow and Rogers?

A. About fifteen hundred.

X Q. 110. The Hoosier?

A. Well, they estimate them at about one hundred.

X Q. 111. The Gorham?

A. I have estimated that at five hundred.

X Q. 112. Van Brunt and Barber?

A. I estimated those two firms, Van Brunt & Barber and Van Brunt & Davis, at twenty-five hundred.

X Q. 113. The Agricultural Company, at Lake Mills?

A. From three to four hundred.

113 X Q. 114. The Rockford Company?

A. That is the Gorham.

X Q. 115. Esterly & Son?

A. I have estimated that at one thousand. I think that is from eight to twelve hundred.

X Q. 116. Rowell & Son, of Beaver Dam?

A. I estimated them at one thousand.

X Q. 117. Fond du Lac Company?

A. One thousand.

X Q. 118. From what source did you obtain your information for these estimates?

A. Some of them were merely estimates made from my knowledge of the trade, others were from the statements of the manufacturers.

X Q. 119. What ones were from the statements of the manufacturers?

A. The DePere—that is, the workman; the Appleton Manufacturing Co., Thomas, Ludlow and Rogers, P. P. Mast & Co., the Fountain city folks said fifteen hundred, but I put them down at five hundred.

X Q. 120. All the rest is guesswork?

A. Yes, sir; and from my knowledge of the seeder trade.

X Q. 121. What do you understand by a brace, as applied to a cultivator tooth?

A. My understanding is the support which removes the terminal strain from a point directly below the drag-bar to a point midway or below the centre of the shank.

X Q. 122. Do you understand by a brace, that it removes the strain entirely from the main shank?

A. I understand that the brace removes the strain from the point of the shank, which is immediately below the drag-bar, to the point of the positive connection between the brace and the shank.

X Q. 123. Does it remove the strain entirely from the main shank? Is that your understanding?

A. Well, nearly so. Yes, sir.

X Q. 124. Do you consider a tooth with a brace as strong as one without?

A. I should consider it stronger.

X Q. 125. How could it be then if the brace removes the strain entirely from the shank?

A. I did not say entirely. I said nearly so.

X Q. 126. I will put the question in this form: If the brace removes the strain nearly entirely from the shank, would a tooth with brace be stronger than a tooth without a brace?

114 A. It divides the strain, and also has a pressure directly against the iron endways, instead of applying directly across the shank.

X Q. 127. Do you still hold your opinion that it removes the pressure nearly entirely from the shank?

A. I think it does. I think the main pressure passes against the brace in the rear of the shank, leaving the strain at the point of the junction of the shank and drag-bar.

X Q. 128. You have stated that the defendants have obtained their seeders through you for the past two years?

A. Yes, sir. I sold them to them.

X Q. 129. How many did you sell them?

A. In the past two years?

X Q. 130. Yes, sir.

A. About two hundred and fifty.

X Q. 131. How many in the past year?

A. Seventy-six.

X Q. 132. How many Superior seeders have you sold in Wisconsin for the past two years in your agency?

A. I can't state exactly, because I have two States, and I cannot divide them exactly.

X Q. 133. About how many?

A. In Wisconsin?

X Q. 134. Yes, sir.

A. About five hundred annually.

Redirect examination:

Q. Do you consider the Appleton tooth a brace in the sense that the Rowell tooth is considered a brace?

A. No, sir; I don't.

E. J. LINDSAY, being sworn, testified:

Q. 1. State your residence.
A. Milwaukee.
Q. 2. What business are you engaged in?
A. Sale of agricultural implements.
Q. 3. Name some of the leading articles that you deal in.
A. The particular kind?
Q. 4. The general kind.
A. Reapers, mowers, seeders, drills, horse rakes, threshers.
115 Q. 5. You keep a general supply store for the ordinary farmers' tools.
A. Yes, sir.
Q. 6. How long have you been engaged in this business?
A. In this place about ten years.
Q. 7. How long before you came here?
A. Seven years.
Q. 8. You have had seventeen years' experience in all?
A. Yes, sir.
Q. 9. When did you commence selling seeders containing drag-bars like exhibit marked "Defendants' Tooth and Beam?"
A. I supposed, until I took the stand, that Thomas, Ludlow & Rogers were the defendants. I find that the defendants are not Thomas, Ludlow & Rogers, so I shall have to ask you what you mean by defendants.
Q. 10. I refer to the machines having drag-bar and beam like that pointed out to you.
A. I think I commenced selling them in the spring of 1873.
Q. 11. Was it not in 1872?
A. I would not be positive about that, sir.
Q. 12. Are you bearing the expense of defending this suit; if not, who is?
A. Thomas, Ludlow & Rogers, I suppose.
Q. 13. You are not defending it?
A. No, sir.

Plaintiff objects to the testimony of this witness being now taken for the same reason as the preceding witness, that the name and residence of the witness is not given in the answer of the defendants, nor any notice of the same in the answer given under the statute which requires such notice to be given.

Q. 14. Did you handle any seeder before you commenced selling Thomas, Ludlow & Rogers'; and if so, whose?
A. We handled seeders made by J. S. Rowell & Co., at Beaver Dam, and by J. S. Rowell & Son, the same firm under a different name.
Q. 15. Look at exhibit marked "Plaintiffs' Tooth and Beam;" have you handled seeders of Rowell & Son having teeth like that?
A. Yes, sir.

Q. 16. Since you commenced the sale of seeders manufactured by Thomas, Ludlow & Rogers, have you sold seeders like that?

A. We have.

Q. 17. How long did you sell them?

A. For two or three years.

Q. 18. Since that what have you been selling?

116 A. Since that we have been selling almost entirely the seeders made by Thomas, Ludlow & Rogers.

Q. 19. During the time you were selling seeders containing bar and tooth like the one shown you, marked Plaintiffs' Tooth and Beam, did you have any complaint made by farmers or users in regard to them; and, if so, state fully what it was?

A. We had complaints of several kinds.

Q. 20. I am only referring to the drag-bar and beam.

A. They complained of the difficulty of holding the teeth in the proper position after using them, particularly after having used them for a while.

Q. 21. What caused the difficulty?

A. The difficulty was a lack of ability to hold the teeth in position by the device designed for that purpose. That only obtained, however, in places where there were serious obstructions in the soil; where the ground was rough, containing stones and stumps.

Q. 22. Where did they say the device wore; in what manner?

A. They complained that the wood wore when they were using this kind. I suppose that is what you refer to.

Q. 23. Yes, sir. Look at the tooth now shown you, marked "Defendants' Tooth and Beam;" have you had complaints of any kind with regard to that device; if so, state them?

A. Yes, sir, we have; the complaint has been the lack of strength in the shank of the tooth.

Q. 24. What did that cause?

A. It caused the bending of the tooth, and a difficulty to make it operate successfully.

Q. 25. On account of the bending?

A. Yes, sir.

Q. 26. Did you have that trouble with the Rowell device?

A. I don't recollect that we did.

Q. 27. Has not the defendants' tooth a brace like that in the Rowell's or plaintiffs' device.

A. No, sir; there is an absence of a brace in the defendants' tooth.

Q. 28. Do you consider the two devices the same?

(Objected to.)

Q. 29. Practically, with reference to the brace and the mode of operation of the slipping of the tooth?

A. I do not.

Q. 30. Do you consider them different?

A. I do.

Q. 31. In what respect?

117 A. The tooth of the complainant is held in place by the

clamping of the brace, and the tooth of the defendant is held in place by the clamping of the tooth itself, by the shank of the tooth.

Q. 32. How is the strain imparted practically to each drag-bar respectively from the point of the tooth?

A. The strain is imparted in the tooth of the plaintiff by the brace, and it is imparted to the drag-bar of the defendant through the shank of the tooth.

Cross-examined:

X Q. 1. How many years have you been selling cultivators containing the tooth shown here as defendants' tooth and beam, manufactured by Thomas, Ludlow & Rogers?

A. I think five years.

X Q. 2. When did you commence—what year?

A. We sold the first ones in the spring of 1872 or 1873.

X Q. 3. How many did you sell the first season?

A. About seven, five or seven.

X Q. 4. The second season?

A. I did not sell them the year following, nor the year following that.

X Q. 5. The two succeeding years you did not sell them?

A. The two succeeding seasons we sold none that I remember.

X Q. 6. When did you commence selling the second time?

A. If we sold the first ones in 1872, we sold the next in 1875.

X Q. 7. How many did you sell the season of 1875, or the second season of that device?

A. I am only stating from memory, and I cannot tell positively. I have estimated between fifty and seventy-five.

X Q. 8. In 1876, or the third season of selling that device, how many?

A. I should say our sales had averaged about that up to the present time

X Q. 9. Whereabouts were they sold?

A. They were sold mostly in this and adjoining counties.

X Q. 10. In the State of Wisconsin?

A. Yes, sir.

X Q. 11. I call your attention to the device of the plaintiff, marked "Plaintiffs' Tooth and Beam," and the device of the defendant, marked "Defendants' Tooth and Beam." State whether or not the two beams are slotted in the same manner for holding the respective teeth?

A. I think they are slotted in the same manner.

118 X Q. 12. How is the plaintiffs' tooth held in the beam—in the slot of the beam?

A. It is held by the clamping of the brace which passes through the slot.

X Q. 13. Is that the only way it is held in position?

A. And by a pin passing through the upper part of the shank.

X Q. 14. Is not the defendants' tooth held in the slot by a pin passing through the upper end of the shank of the tooth?

A. No, sir.

X Q. 15. How is it held?

A. It is held in position by a bolt passing through the upper end, and the clamping of the tooth itself.

X Q. 16. Of what does defendants' tooth consist?

A. It consists of a bar of iron with steel points welded to it, and a brace attached to the rear of the shank, which brace is held in place by the clamping of the two sides of the bar against it. I misunderstood the question. I was describing the plaintiffs'. The tooth of the defendant is a bar of iron with a steel point welded to it, having a grooved circle, the principal part of which is held in place by the clamping of the two sides of the bar through which it passes.

X Q. 17. Are not both of the teeth held in place by pivots?

A. They both work on pivots; yes, sir.

X Q. 18. What do you understand by a brace?

A. I understand by a brace as applied to the bar of seeding machines, to be, in the common acceptation of the term, a device which holds the shank of the tooth in place, and gives it strength to resist the force which is applied to that point.

X Q. 19. You have said that the objection which you have heard made to plaintiffs' tooth was in not keeping its position when meeting with serious obstructions, I believe?

A. Yes, sir.

X Q. 20. Is that the only complaint you have heard against the tooth?

A. There has been another complaint, not so general, of gathering rubbish—corn-stalks.

X Q. 21. To what extent have you heard that complaint?

A. Not to much extent.

X Q. 22. Not enough to pay attention to?

A. No, sir. Not enough to interfere with the sale of the machine.

X Q. 23. You are brought by your business in contact with all the seeders that are in the market, are you not?

A. Yes, sir; more or less.

119 X Q. 24. Is it not one of the points of the Rowell slip tooth that it should slide back when striking serious obstructions, in order to prevent the breaking of the machine?

A. Yes, sir. That is one of the claims made by the manufactures.

X Q. 25. Is it not in your opinion an important claim for such seeders?

A. When such holding of the teeth can be kept under control of the operator, I think it is.

X Q. 26. When the slot bar becomes worn by using, for instance in the Rowell brace and tooth, can it not be easily obviated by tightening the screw?

A. It can for a time.

X Q. 27. You know the slot bar holding the Rowell tooth usually lasts as long as the seeding-machine?

A. It will in ordinary soil.

clamping of the brace, and the tooth of the defendant is held in place by the clamping of the tooth itself, by the shank of the tooth.

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X Q. 26. When the slot bar becomes worn by using, for instance in the Rowell brace and tooth, can it not be easily obviated by tightening the screw?

A. It can for a time.

X Q. 27. You know the slot bar holding the Rowell tooth usually lasts as long as the seeding-machine?

A. It will in ordinary soil.

X Q. 28. In the soil usually found throughout Wisconsin, Minnesota, and Iowa?

A. I think it would.

Redirect examination:

Q. 1. You say that the teeth of both the defendants' and the plaintiffs' work on a pivot. Do you mean to be understood that they both work on a pivot when in the act of cultivating only?

A. No, sir. I mean to say they work on a pivot when they change position in the bar.

Q. 2. But when they are moved back by going over an obstruction, they then work on the center?

A. I don't think I catch your meaning.

Q. 3. In passing over an obstruction they work on a pivot?

A. If I understand, they work on a pivot. I understand that this pin which passes through the shank of the tooth has a pivotal point, and whether they work backwards or forwards they work on the pivot.

Q. 4. But when they work stationary do they work by friction or pivot?

A. By friction.

Q. 5. Friction wholly?

A. Not wholly; but friction is the principal.

Q. 6. Now, what kind of land is it in the territory where you sell these teeth?

A. It is usually free from rubbish.

Q. 7. You don't sell teeth very generally where the farms are new?

120 A. No, sir.

Q. 8. And so I suppose the majority of your customers don't use seeders in soil where they run against roots and stumps?

A. Most of them do not.

Q. 9. Would you, from your knowledge of the Rowell beam, in soil where there are a great many obstructions so that the action of slipping was called into operation quite frequently, think the bar would wear as long as the machine?

A. I think it would usually. The cases where it would not are an exception.

Q. 10. Was the complaint of this kind that you had enough to interfere with your trade or not?

A. Yes, sir. It was an objection magnified by the competitors.

Q. 11. Did you have that objection made to the one you are now selling the defendants?

A. The question of holding it in position?

Q. 12. Yes, sir.

A. No, sir.

Recross-examination:

X Q. 1. Are not both of these teeth held or turned on a pivot?

A. They turn on a pivot.

X Q. 2. In the Rowell tooth when it slips back, is there not a downward pressure on the pivot?

A. No, sir; I think the pressure is forward; well downward or forward. It is difficult to say. Probably it does. I should say forward.

X Q. 3. Well, forward. There is a pressure on the pivot?

A. Yes, sir.

X Q. 4. In the defendants' tooth and beam when it slips back, is not the pressure on the pivot also?

A. No, the pressure is downward. The pressure is on the pivot, but downward.

X Q. 5. Is not the pressure in the plaintiffs' tooth when it slips along also downward, at least to some extent?

A. No, sir.

X Q. 6. Now, when I press upon the point of that tooth, is not the pressure downward?

A. In practical use there is not any pressure there.

X Q. 7. Placing an obstruction there, is not the pressure downward?

A. It would be if it was working in that position, but the tooth is not used in that position in practical use.

121 X Q. 8. In the Rowell tooth when it meets an obstruction, does it not play back?

A. Yes, sir. But I never saw a farmer use a Rowell tooth in that shape.

X Q. 9. I am not speaking of the use; but when it meets an obstruction does it not put it into that shape?

A. The resistance offered is in different manner as the tooth occupies different positions.

X Q. 10. In all positions the tooth assumes in meeting obstructions is not the pressure more or less downward on the pivot?

A. No, sir.

X Q. 11. In both the device of the plaintiff and defendant shown you, when the teeth meet an obstruction and pass forward, are they not clamped and held in position by the same pressure?

A. No, sir. By the same pressure? Yes, sir; but applied differently.

X Q. 12. The are clamped in the same manner?

A. They are held by the same kind of pressure, but applied in different manner.

X Q. 13. Are they clamped in the same manner?

A. I think they are. There should be a discrimination made in my answer. When you put the question between the bar and the tooth, if you speak of the clamping of the drag-bar, my answer is correct; if of the clamping of the tooth, my answer would be incorrect. The drag-bars are clamped in the same manner.

X Q. 14. Are not the two teeth held by the same pressure in the drag-bar?

A. The same kind of pressure, but applied to the tooth differently.

X Q. 15. Are not they applied in both teeth by compression of the slotted drag-bar against the teeth?

A. No, sir.

X Q. 16. What is the reason?

A. The teeth of the Rowell seeder is not by compression. The tooth of the defendants' drag-bar is compressed.

X Q. 17. You make a distinction then between the shank of the tooth and the brace of the tooth?

A. I do, sir.

X Q. 18. That is the only difference in holding there is between the two teeth?

X Q. 19. Is not your claim that in one the power is applied against the brace and in the other against the tooth?

A. I do, sir.

122 X Q. 20. I believe you stated that as to the wear of these teeth you never had complaints enough to make any practical difference in the sale?

A. The complainant's tooth; no, sir.

X Q. 21. Now, farms in Wisconsin, Iowa, and Minnesota usually do not have any rubbish on them, do they?

A. I have had no experience on them.

X Q. 22. Are not prairie farms the principal kind of farms in the three States which are being now opened, and have been for two or three years past?

A. Rubbish usually accumulates on a farm after it has been cultivated.

Close of testimony.

Defendants' counsel now offer in evidence the following exhibits:

The De Pere drag-bar.
The Esterly drag-bar.
The Harris drag-bar.
The Gorham drag-bar.
The Mast drag-bar.

Circuit Court of the United States for the Eastern District of Wisconsin.

JOHN S. ROWELL and IRA ROWELL
vs.
EDMUND J. LINDSAY and WILLIAM LINDSAY.

Examination of witnesses on behalf of the defendants, under the sixty-seventh rule in equity, as amended, pursuant to notice.

Present: James J. Dick, Esq., for the complainants; E. E. Word, Esq., for the defendants.

D. J. POWERS, being first duly cautioned and sworn, testified as follows:

Q. 1. State your name, age, residence, and occupation.

A. D. J. Powers; age, over sixty; residence, Chicago; occupation, mechanical engineer and manufacturer.

Q. 2. How long have you been engaged in mechanical pursuits

and in manufactures, and if you have had any experience
123 with the manufacture and sale of mechanical implements, state when, where, and what kind of implements you have had that experience with?

A. I have been engaged more or less for twenty years as a manufacturer and dealer in agricultural machinery, and at one time made seeders and grain drills. During that period I was familiar with the working of seeders and grain drills in the fields on the farms, having had occasion, of course, to see the working of machines and to test and improve my own. My manufactory was at Madison, Wis., of agricultural machines. My present manufactory is at Chicago, Ill.

Q. 3. What experience, if any, have you had in instituting comparisons between different mechanical devices and drawing conclusions with respect to their relative points of difference or agreement?

A. I have more or less to do with patents and patented inventions for the last twenty years, having had quite a number of inventions of my own patented, and having often been sworn as an expert in patent litigations before the United States courts. In these various cases I have had occasion to make many careful comparisons of similarities and differences in different patent devices and inventions.

Counsel now offers in evidence the following exhibits, to wit:

1. A certified copy of letters granted David Eberly December 22, 1857, No. 18894, for improvements in shovel plows, marked "Exhibit Eberly Patent."

2. Also certified copy of letters patent No. 36672, granted John S. Rowell and Ira Rowell, as assignees of John S. Rowell and Michael F. Lowth, October 14, 1862, marked "Exhibit Rowell Patent."

3. Also a certified copy of the reissue of said last-mentioned patent, marked "Exhibit Rowell Reissue."

4. Also a certified copy of letters patent No. 7241, granted L. Haversticke April 2, 1850, for an improvement in grain-drill, marked "Exhibit Harversticke Patent."

5. Also a certified copy of letters patent granted Fowler & Bacon March 28, 1865, No. 47008, marked "Exhibit Fowler & Bacon Patent."

6. Also a certified copy of letters patent No. 54089, granted C. Atwood April 24, 1866, marked "Exhibit Atwood Patent No. 2."

7. Also a certified copy of letters patent No. 51536, granted C. Atwood December 19, 1865, marked "Exhibit Atwood Patent No. 1."

Counsel for the plaintiffs objected to the last exhibit, for the reason that reason was not made to it in ths answer.

8. Also a device consisting of a plow and portion of a beam, marked "Exhibit Atwood Plow."

9. Also a certified copy of letters patent No. 51768, granted Whiting & Mapes December 26, 1865, for an improved grain drill.

Counsel for plaintiffs object to this exhibit on the same ground.

124 10. Also a certificate of letters patent No. 46654, granted March 7, 1865, to H. Francisco, for an improvement in cultivator teeth, marked "Exhibit Francisco Patent."

11. Also a certified copy of file wrappers and contents of the Atwood patents, Nos. 1 and 2 respectively.

Counsel for the plaintiffs object to No. 1 on the same ground.

12. Also a certified copy of letters patent granted to J. H. and J. W. Thomas June 13, 1874, No. 152,706, marked "Exhibit Defendants' Patent for an Improvement in Seeding Machines."

Counsel for plaintiffs object to the exhibit for the same reason.

Q. 4. Have you read the deposition of Carroll Atwood, taken in this case, and examined therewith the construction and operation of "Exhibit Atwood Plow"? If yea, please state whether you understand the operation and object of such exhibit.

A. I have examined said deposition and plow, and fully understand the operation of the exhibit—the plow.

Q. 5. Please state if you have examined the exhibits Francisco patent, Haversticke patent, Fowler & Bacon patent, Eberly patent, Atwood patent No. 2, Whiting & Mapes patent, Exhibit Rowell Reissue; also Exhibit Complainants' Patent, reissued No. 2909, dated March 31, 1868, Exhibit Defendants' patent. Please state if you have read those several patents and examined the drawings in connection therewith; and, if yea, do you understand the construction and mode of operation of the several exhibits therein shown and described?

A. I have examined all the exhibits enumerated in the question, having read the specifications and examined the drawings of the same. I believe I understand the devices and their operations therein shown and described.

Q. 6. Please again examine plaintiffs' reissue and state what devices compose the mechanism specified in the claim of the patent, how they operate, and what purposes they are declined to accomplish.

A. The devices enumerated in the claim of said patent are a slotted beam, large A, a shank, B, and brace-bar C, and bolt D for a combination, and the invention is stated to consist "in applying to the shank of the tooth a curved brace-bar, the upper end of which passes through a slot or mortise in the beam, and it is held in position by a clamping bolt, which passes transversely through the slot or mortise near the brace-bar and forces the sides of the beam together against the brace-bar, so as to clamp it in any required position, and thereby adjust the teeth in any inclination, at the same time allowing it to yield to immovable obstacles without breaking." The foregoing are the elements and combination of the claim, and the recited description shows the manner of applying and operating the same, the object being to adapt the shovel or tooth of the cultivator to the beam in such a manner that it would stand firm
125 to its work in ordinary soil and yield or give back when encountering obstructions, so as to prevent breakage. It will

be seen that this object is accomplished by hinging the standard of the shovel loosely to the beam, and by the application of a back-brace welded upon the shovel-standard and passing up through the slot in the beam, and the application of the clamping-bolt through the sides of the beam to confine the brace from slipping or giving back except when extraordinary strain is encountered by the tooth or shovel of the standard.

Q. 7. What constitutes the hinge device? How is it marked in the patent?

A. The hinge device is marked small *b* in the patent, and consists in the securing of the bolt or pivot through corresponding holes in the standard and beam.

Q. 8. Did you or not find this pivot to be specifically named in the claim?

A. I did not find the pivot referred to in the claim.

Q. 9. If this pivot was omitted from the device, would it, or would it not, in your opinion, practically operate in the manner described for the device in the specification?

A. It clearly would not; for, if the pivot were omitted, the standard would give back at once when encountering even slight obstructions, notwithstanding the clamping upon the brace in the rear.

Q. 10. Please institute a comparison between the exhibits Eberly patent and Atwood No. 2, in connection with Atwood plow, and recite how they agree with or differ from the device shown and described in the complainant's patent. State whether or not you find substantially the same or substantially different construction or mode of operation, giving your reasons for any opinions you may express?

A. On comparing the Rowell patent exhibit and device therein contained with this Eberly patent, especially in what relates to the shovel-standard and their combination with the plow-beams, I find the two devices to consist of substantially the same elements and in substantially the same combination. In Eberly I find a shovel-standard, pivoted freely to the plow-beam, so that it can turn forward or backward, and secured to the beam by a brace applied to to the shovel-standard, and is secured to the beam by a clamping-bolt, the brace having a slotted end where the clamping-bolt passes through it of a character to admit of the standards being set to any desired adjustment, or to allow the standards to recede backward when encountering obstacles, to a sufficient extent to release it from breakage. In the Eberly device I find all the elements substantially that are enumerated in the Rowell claim, to wit: The combination beam and brace, a slot, and a clamping bolt. The only differences that I do find between them appear to be mechanical and such adaptations of the different parts as were found to
126 be convenient by the mechanics constructing them; for instance, as before stated, the Eberly brace contains the slot which is found in the beam of Rowell, each of which is for the purpose of allowing the brace to move forward or backward for the adjustment of the standard or the escape of it in case of obstacles. The brace in Eberly, instead of being curved, as it is in Rowell, is

loosely jointed to the standard which equally well admits of its travelling backward and forward. As before stated, the four elements of the beam—the hinge, standard, and a slot and a clamping-bolt to secure the brace through the slot—are found equally in both patents, the slot in Eberly being in the brace and in Rowell being in the beam, through which the brace passes, both working substantially alike in use, and clearly being mechanical equivalents, the one for the other. The welding of the brace to the rear of the standard in Rowell, and passing it up through a slotted beam, may be considered a mechanical variation merely, or possibly may be considered an improvement upon the Eberly, a perfecting patent; but, in either case, it is obvious that it contains no new element or new combination of essential parts. They both work upon substantially the same principle, and both employ the same well known elements of hinges, braces, slots, and securing bolts. The removal of the slot from one part of the combination to another, and thereby securing no new results, or the removal of the clamping-bolt, or the jointing loosely of the brace instead of welding it fast to the standard, and producing no new results by the changes, would not appear or strike me to contain anything of invention beyond, at the most, especial arrangement of parts, certainly not an invention, that would be considered broad, or reaching to other or different constructions. For the foregoing reasons I consider the Rowell devices and combinations, enumerated in their claim and described in the specifications are substantially the same in all essential respects as those shown and described in the Eberly patent, and differing only as stated in mechanical forms and adaptations of the same devices for the self same purpose. I can not discover any new result attained by the new adaptations of the parts, or any material difference in the working or operation of the devices in use.

In making a comparison between the Atwood plow and the Rowell patent exhibit, I would say, in the said Atwood plow I find the same four elements in combination that I find in the Rowell, to wit: A plow-beam, a hinge-standard, and a brace in the rear of said standard, secured in a slot or mortise in the beam by a clamping-screw. These four elements appear to me to be the same as those enumerated in the Rowell patent, and in the same combination and for the same purpose and object. Mechanically, the elements and combinations in this Atwood plow resemble, more nearly in their parts, the several parts and combinations of the Rowell device than is found in Eberly, for the reason that the brace is placed in the rear of the plow-standard and passes up through a slotted or mortised aperture in the beam, and is there secured by a clamping-bolt
127 in substantially the same manner as well as place as is the Rowell patent. The only observable difference of a mechanical nature between the Atwood and the Rowell consists in the fact of the Atwood's device, showing a straight brace hinged freely to the standard instead of a curved brace as in the Rowell, and the further difference of the brace being secured in a mortise by a set-screw bolt applied to one side of it instead of being secured between slotted ends clamped together by a bolt as in Rowell. I consider

the Atwood plow to be substantially identical in all material respects with the Rowell device, it containing the same number and kind of elements in identically the same combination, and working substantially identical in all respects. The differences that I have pointed out between them I do not consider material, or other than mechanical differences of construction, in no way affecting the object, purpose, or operation of the respective devices. It appears to me that the Atwood plow would readily suggest to any mechanic, skilled in plow and cultivator making, all of the features and combinations found in the Rowell invention and enable him to construct the same without material difficulty or the use of anything in the way of invention. The substitution of curved rigid braces for a jointed one, or of a clamping device for a mortise and set-screw, under the circumstances, I should not consider required anything more than skill and knowledge of different mechanical devices used for such purposes and a ready adaptation of whichever of them appeared most suitable and proper. For the foregoing reasons I consider the devices and combinations in the Rowell patent to be substantially the same both in character and operation as those found in the Atwood. I find the Atwood plow to correspond with and be the same as the one shown and described in the Atwood plow No. 2.

Counsel for the plaintiffs objects to so much of the answer of the witness as gives his opinion upon the construction and effect of the patent law, and asks the same to be stricken out.

Q. 11. If it be material to the operation of Rowell's device, shown in his patent and illustrated in plaintiffs' plow, tooth, and beam now shown you, that the gripe or friction shall remain continuous during the backward passage of the tooth in passing over an obstruction, do you find this continuous clamping in the Atwood and Eberly devices, respectively, or not?

A. I do find the same continuous friction in the Eberly and Atwood devices that is referred to in the question.

Q. 12. Please look at the Rowell reissue, No. 3373, dated April 13, 1869, and state how it agrees with or differs from the device shown and described in the complainants' patent.

A. I find on comparing the respective devices that they both consist of the same general elements of a beam, of a hinge-plow standard,
a brace to secure the standard to the beam, and a clamping-
128 bolt to secure the standard to the brace, or the brace to the
beam, with slotted devices in each case. The combination in this 1869 reissue thus consists of substantially the same four elements that are found in the complainants' patent, and the difference between them consist in the form and application of the brace to the support, the standard to the beam. In the reissue of 1869 the brace is forked where it is applied to the standard and extends forward and is secured to the beam. There is a clamping-bolt applied to the forks of the brace to compress the forks together and secure and hold the standard in position. In the complainants' patent, as before recited, the brace is attached rigidly in the rear of the standard, and is secured in a slot in the rear of the beam by a clamping-

bolt. This difference in the form and application of the brace constitutes the only difference between the two devices, and, as before stated; when comparing complainants' patent with the Eberly and Atwood, I regard the differences between the construction in this reissued patent and complainants' patent to be subordinate in character and not material in any broad or general sense as to the combination or working of the respective devices. The welding of the brace in the patent of 1869 to the rear of the standard in the complainants' patent, and removing the compensating slot to the beam instead of the rear of the brace, could, at most, only be considered a limited change, and one involving very little or no invention. The change and adaptation of the brace in the manner stated, could not be considered to secure any very materially new result or purpose, only securing the result in a slightly different manner. In either case the plow standard would be held to its work under ordinary circumstances, and would be capable of adjustment to different positions for working, and also to escape by receding backward whenever encountering material obstructions. It appears to me that the shifting of the slot from the brace to the beam and applying the brace rigidly in the rear of the standard, instead of jointedly in front, amounts to very little difference other than mechanical. If any material difference at all, such a change would certainly not be of a character to warrant the supposition that complainants' patent contained anything broad or material in the way of invention when considered in relation to the state of the art at the time of making the change from what is shown in the reissue of 1869 to what is shown in the complainants' exhibit.

Complainants' counsel object to so much of the testimony of the witness as seeks to construe these patents and the effect of them, and asks that the same be stricken out.

Q. 13. How does the Harversticke patent agree with or differ from the complainants' patent, in your opinion, so far as the devices of the Harversticke relate to the cultivator tooth?

A. The Harversticke patent shows a hinge shovel or tooth to its drag-bar, held to its working position by a spring and a clamping-screw, which is overcome when obstructions are encountered
129 and the tooth allowed to turn back upon its beam. This patent shows the same purpose on the part of the inventor as does the complainants' patent exhibit, and the attainment of it by means somewhat similar, but not by means containing the same number and kinds of elements that are found in said complainants' patent exhibit. There is no proper brace or slot shown in the Harversticke, but instead thereof devices that were made to serve the purpose. This patent shows, as before stated, the same purpose and object, with a somewhat similar means of attainment, and serves to show the development of the idea in the state of the art of yielding teeth or shovels in cultivators, showing that such ideas were not new for many years before the invention shown in the complainants' patent exhibit.

Counsel for the plaintiffs object to so much of the testimony as

gives the witness' opinion on the state of the art and the effect of the same upon the invention of the plaintiffs, and asks the same to be stricken out.

Q. 14. How early have you known of a slotted wooden support or holder and a through clamping bolt to be used for holding or adjusting teeth in position; and if you have an illustration of any such clamping device, please produce it, and state what it is and how long you have known such things to be used?

Counsel for plaintiffs object to this question asked of the witness, for the reason that no notice has been given in the defendants' answer of the use of or knowledge by this witness of any such thing, and no notice was given in such answer of a time and place where the same is used; and he objects further to any illustration of such device being shown without such notice, and the reading and production of the same.

A. I have known of such devices as are enumerated in the question ever since I can remember as a mechanic, and one of the most frequently seen is found in what is known in mechanical parlance as a beveled square, one of which I here produce. It will be seen that the body of this square is composed of a piece of wood slotted part way from one, and into which slot is inserted a bolt having a slotted mortise in one end of it, and through which and through the two sides of the slotted wood is passed a clamping bolt with a screw-nut on one end, making a device that admits of clamping the slotted metallic blade in any desired position, the object being to set the blade to describe different angles in mechanism, and used for forming angles or cutting joints, and for various purposes.

Q. 15. About how many years have you known such tools to be used, and how common has been their knowledge and use by mechanics?

Counsel for plaintiffs object to the question for the same reason.

A. I have known them in use for at least fifty years, and my observation is that all carpenters and joiners, cabinet-makers, and similar mechanics have them among their kits of tools as commonly as they have a saw or a carpenter's square.

Q. 16. Please look at the exhibit now shown you and state
130 how it compares in principle, and construction, and mode of operation with the device shown in the Eberly patent.

A. On looking at and comparing said exhibit with the Eberly patent exhibit, I find it to be identical in principle and construction, so far as the issues in this case are concerned, with those of the Eberly patent. It differs only in having a straight instead of a crooked brace, and in the fact that the shovel standard is joined directly to the sides of the beam, instead of being carried out laterally from it. The reason of these differences is that in the Eberly device two shovels were put upon one beam, and had to be carried to a proper distance from it, thus rendering it necessary to carry the shovels out sideways from the beam, and also to crook the brace to reach the

standard and beam; whereas, in this exhibit, only a single shovel is placed upon the beam, which admits of a straight brace; but in principle they are identical, as well as in operation, the only difference being the mechanical one that I have mentioned.

Counsel for defendants here requests the device to be marked "Exhibit Eberly Tooth and Beam." Counsel for plaintiffs object to its being marked as stated.

Q. 17. How long have you known set-screws to be used as clamping devices; and if you have known them to be used in connection with a curved brace, operated in a similar manner to the curved brace of complainants' patent, will you please state how common such use is, how long you have known it, when and where; and if you have a device illustrating the device, please produce it?

Counsel for the plaintiffs objected to the question for the reason that the defendants gave no notice of such thing being in use or knowledge of such invention, or that they would give testimony concerning the same on trial.

A. I have known set-screws to be used as clamping or securing devices from my boyhood, and have also known them to be applied to instruments containing circular devices, upon which the set-screws were applied to hold instruments and tools in position. One of the most common applications that occur to me is that used in dividers, callipers, and similar tools like the dividers I here present. The legs of these dividers, it will be seen, can be opened or closed, and secured in any position that may be desired, by means of the set-screw upon the circular brace or circular connection.

Q. 18. How long have you known such instruments to be in use, and how common are such uses?

A. Such dividers and callipers I have known to be in use for more than forty years, and made them myself on the same identical plan of construction more than that length of time ago, when I was a practical machinist. They are as common in use as almost any tool you can mention, and have been from that time to this.

131 The dividers and bevel square referred to by the witness, respectively, "Bevel Squares" and "Exhibit Dividers."

Q. 19. Please look at the Francisco patent now shown you and state how it agrees with, or differs from, the devices described and shown in complainants' patent.

A. The device in the Francisco patent in several respects resembles the device in the complainants' patent exhibit, it being a shank or standard for cultivator tooth secured in a wooden beam, secured in a long mortise, being pivoted at its rear side and the standard looped over at the top, carried down and joined below in such a form as to present a cam-like face upon its front side; and, in connection with this cam-like face, there is a sliding plate upon the top the of drag-bar secured by a clamping-bolt, so applied that, when the tooth is working in ordinary soil upon the standard, the slide retains the standard in position; but when extraordinary resistance

is encountered by the tooth and standard, the cam form of the circular top of the standard bears upon the slide and is enabled to retire the slide forward, so that the tooth can turn backward and save itself from breakage. This device resembles, somewhat, the device in the complainants' patent exhibit by being in brace form by means of the loop at the top of the standard, and in operating in a long slot or mortise in the wooden standard, and in being held to its working position by a friction device clamped to the beam. Still the devices are not substantially the same, although this construction is quite suggestive of the construction in the Rowell patent, and by slight modifications and changes, appears capable of having been adapted to the same construction as the Rowell. Still, in the form I find it in this patent, I regard it, on the whole, as a different device from the Rowell patent exhibit; but, as before stated, the bracing form of the shovel-standard, the pivoting of it in the wooden drag-bar, and the resistance applied to the forward bracing portion of the standard, to a certain extent, presents considerable resemblance to the Rowell device. The simle appplication of a clamping bolt through the sides of the beam inside the loop, would have made it substantially Rowell's device.

Q. 20. How, if you should use the set-screw passing through one side of the beam and pressing upon the forward or brace part of the loop, would it then agree with the complainants' patent; and state whether or not you find the same element operating in the same manner producing like results as the complainants?

A. I consider the application for a set-screw as stated would be equivalent of a clamping-bolt passing through, as I have stated before. The set-screw and clamping-bolt are substantially the same device. In many cases, one is the equivalent of the other. Whether the set-screw presses together mechanically as the clamping-bolt is another question; but it could clearly be used to secure the shovel standard by proper adaptation as effectually, nearly, or quite so, as the clamping-bolt.

132 Q. 21. Which do you think would wear the longest and resist the most strain, such a set-screw as is shown in the Atwood plow, or the slotted beam where there is frequent use of the slipping device?

A. Metal to metal, as in the Atwood plow, would, of course, last longer in practical use than iron slipping upon a wooden surface which would, in the nature of things, wear out sooner, from its less substantial character, than would the metallic devices operating together.

Q. 22. Suppose you use the set-screw or clamping device, as indicated with the Francisco device, instead of the peculiar spring there shown, would it or not, in any manner, change the consequence or accomplish any new result in the operation of slipping the teeth?

A. I do not consider that it would, for the reason that the function of the plate in the Francisco is to hold the shovel in position, and the set-screw that held it in position would perform the same

function beyond a doubt just as effectually, being applied to the side of the front loop of the standard in some proper manner.

Q. 23. Would it or not be easy to apply the Eberly form, slotting the forward part of the loop and clamping it in that way?

A. It would clearly involve only the expense of slotting the forward limb of the loop, which, under a proper press, could be done in an instant and at no comparative expense.

Q. 24. Will you please look at the Fowler & Bacon patent and state how it agrees with, or differs from, the complainants' patent. State whether or not you find the same result accomplished in that device.

Counsel for the complainants objects to any testimony being given under what is called the Fowler Bacon patent for want of notice in the defendants' answer.

A. The Fowler and Bacon patent differs from the Rowell patent in so far as it employs a different mechanical construction for securing the same purposes. In the Fowler & Bacon device the standard is hinged at the axes of the double-quadrant circle, the standard being placed between them and the pivot on which the standard turns is adapted, by means of being tapered, to arrange in the openings of the quadrant circle and standard, so that when driven in or forced in, it causes the shoulders upon the standard to press hard against the periphery of the quadrant circle with such force as to hold the shovel in position by friction in ordinary working, but not so rigidly but that the encountering of obstructions causes the shovel to turn backward and release itself. In mechanical structure this Fowler & Bacon device differs from the Rowell device, but in invention and operation it is substantially the same. It is held in position by friction, and has the capability of letting go under exraordinary resistance. The quadrant iron that holds the standard is also so constructed and applied as to furnish a brace to
the standard very similar to the one used by Rowell in
133 strengthening and supporting functions, and is applied in very
nearly the same place in the rear of the standard.

Q. 25. Is not the clamp continuous in this device in passing over obstructions?

A. It obviously is continuous, as in the Rowell device.

Q. 26. Please compare the device marked "Defendants' Tooth and Beam" with the device shown and described and shown in the complainants' patent; state how they agree or differ in mode of operation and construction, and whether or not, in your opinion, they are substantially the same, or substantially different devices, giving your reasons therefor.

A. On an examination of the defendants' device I find it to consist of a straight standard below the beam, turned over at the top, and pivoted at its front end in a slotted beam, and held in position, when at work, by this front pivot and a clamping-bolt passing through the sides of the beam immediately in front of the standard. This construction is calculated to hold the standard in position in proper work, and when an obstruction is encountered that will not yield

the standard can sweep back in the beam upon the axis of the forward pivot and release itself from the obstruction. It differs from the complainants' device in the fact that it consists of a straight standard without any brace, and in being secured in the drag-bar in such a manner as to have a materially different motion when forced by an obstacle in the drag-bar from what is found in the complainants' device. It has but three elements of the complainants' summing up in their device, to wit, a standard, a beam, and a clamping-bolt. True, it has a pivot, on which it turns in front, or rather a bolt. So has the complainants' device in front, which is not enumerated in their elements of their claim. Therefore, I do not count the pivot, or bolt, in the defendant's device as an element in comparing it with the complainants' device and summing up in the claim. Thus, the defendant's device differs in the points I have stated, in the construction, and also differs in its operation in use when in the act of escaping any obstruction encountered. The defendants' device, from being a naked shank or standard below the beam, presents less for collecting stubble or debris of any description in its operation in the field, and is obviously a simpler standard or shank to construct than is that of the complainants. For the foregoing reasons I do not consider them either the same in construction or substantially the same, but substantially different.

Cross-examination:

Question by Mr. DICK:

Q. 27. Do you consider yourself an expert in the construction of patents?

A. I do, so far as similarities and differences are concerned—likes and unlikes.

134 Q. 28. Have you heretofore been called as an expert to give your opinion in reference to the Rowell beam and tooth?

A. No; not that I recollect of, so far as the patent at issue in this case is concerned.

Q. 29. What tooth have you been called upon to give expert testimony upon of Rowell's?

A. Upon the one shown in the reissue of 1869.

Q. 30. The one that you claim is identical with the one in controversy in this suit?

A. I am not aware that I have claimed that it is identical in those words, or what amount to the same.

Q. 31. What did you state in reference to that point?

A. I will ask the notary to go back and read what I said.

Q. 32. I want you to state it now; I don't want the notary to do any such a thing; what did you state in reference to that point?

A. I repeat the answer I did state.

Q. 33. Very well; repeat it, then.

A. I have a right to repeat it from the record, too.

Q. 34. No, sir; you have not; if it comes to that, we will have the notary note down that you refuse to answer the question.

A. I do not refuse at all. My recollection is that the Rowell pat-

cuts were substantially alike in the main, and that the only difference between them was the different application of the brace and slot.

Q. 35. Do you consider the two teeth substantially like the two Rowell teeth?

A. I do, so far as their general functions and operation are concerned; but not identically alike, mechanically, by any means.

Q. 36. Now, in what suit were you called as an expert in reference to the tooth of 1869?

A. I was called in two different suits—in the one between the Rowells and Barber & Van Brunt, of Horicon, and, to the best of my recollection, in another suit between the Rowells and the Harris Manufacturing Company, of Janesville, Wis.

Q. 37. For which side were you called as a witness?

A. For the defense, in both cases.

Q. 38. Can you state if your testimony in regard to the Rowell reissue of 1869 is similar to the testimony you have given here to-day in reference to it?

A. I have no doubt whatever but that it is substantially the same, because I always testify upon the facts in the case. So far as I have had the same testimony before, I have not the least doubt but what my testimony is substantially the same.

135 Q. 39. Have you had any practical experience with the workings of the several devices in reference to which you have testified; if so, give one, and where and when?

A. I have seen several of these devices at work in the field, among which were Rowell's seeders and Esterly's seeders and the Barber & Van Brunt seeders, containing their various safeguards for the teeth, and I think I have seen the Harris Manufacturing Co.'s seeder in operation, but I will not be positive about it. I saw the machines that I have enumerated in operation in the counties of Dane, Dodge, and Jefferson, in the State of Wisconsin, and very likely in every county in that State, in different years, from 1862–3 up to 1873–4. During all those early years I was selling agricultural machinery in Wisconsin. I often followed it to the field, and during those times I saw nearly all the machines in operation that were in use at that time in that region.

Q. 40. Have you given any testimony to-day in reference to the Esterly machine and the Barber & Van Brunt machine you mentioned?

A. No; none in particular.

Q. 41. Have you in general?

A. Nor in general; neither special or otherwise.

Q. 42. In construing a patent, do you or do you not take the patent and drawings and specifications together for your guide?

A. I do, and the summing up as well.

Q. 43. Can you construe properly a patent without the drawings and specifications?

A. Not ordinarily, I don't think.

Q. 44. Does not one depend upon the other for a proper construction?

A. I believe it is usually recited that they are part and parcel of all patents, and are to be read in connection where there are drawings. It sometimes happens there are no drawings.

Q. 45. Is not the drawing to be taken in connection with the specifications for a proper understanding of the construction, operation, and the claim of the patentee?

A. Yes, undoubtedly; as an ordinary thing.

Q. 46. And do not the drawings, when the specifications are of a doubtful import, have to be taken for a full explanation and understanding of the patent?

A. I so understand, and that either can be amended by the other.

Q. 47. Do you consider it proper in construing a patent, in reference to the operation of the patented invention, to claim for it more than the patentee does himself in the patent, drawings, and specifications?

A. I should say not, ordinarily.

136 Q. 48. Is it proper ever?

A. If I am called—

Q. 49. Say yes or no.

A. If I am called—

Q. 50. Counsel for the defendants: Say "yes" or "no."

A. I should say I had no right to construe a patent as going further than was shown or described in the patent.

Q. 51. What do you understand invention to be?

A. I understand invention to be the devising of something new and useful, either by original devices or old devices combined, or old and new devices combined, as the case may be, by which new and useful results are capable of being produced.

Q. 52. In order to an invention is it necessary that new results should be obtained or improved results?

A. Improved results, I consider, would warrant invention.

Q. 53. State whether or not, in your opinion, an improved result may consist in a more simple device and operation.

A. I hardly think that simplification merely is considered invention in the purview of our Patent Office.

Q. 54. Do you consider yourself an expert in the construction of the patent law of this country?

A. I do not assume to be an expert in construing the patent law, or any other law, but only an expert in mechanics.

Q. 55. State whether or not, in your opinion, an improved result may not consist in a more simple and perfect operation over an old machine performing the same kind of work.

A. I understand, as I before stated, that the result must be substantially new in order to be patentable. The mere perfecting a result I do not consider would be.

Q. 56. Then, I understand you to say, in your opinion, a result to be patentable must be entirely new?

A. I don't understand myself as having said any such thing. I didn't say any such thing. The language of the law is, that the device must be new and useful to be patentable, not qualified by any adjectives.

Q. 57. If the operation of the machine and its results were more simple and perfect, would or would it not be patentable?

A. I do not understand results to be patentable at all, and, as before stated, mere simplifying and perfecting a machine, without bringing in new principles or combinations into it, I should not consider it to be patentable.

Q. 58. In your opinion, when a device in its mode of operation and in its mode of construction is cheapened in its costs, is it patentable?

137 A. Simpler construction and cheaper as well, I should not consider to be patentable, standing alone by themselves.

Q. 59. Do you consider that cheapness of device over the old one is one of the ingredients which are patentable in a machine?

A. I do not consider cheapness a patentable ingredient. Cheapness may be set up as a merit in an invention, but not as a patentable device.

Q. 60. You have stated that the plaintiffs' exhibit, marked "Plaintiffs' Patent, No. 2209," did not contain one element, to wit, a bolt or pivot through the shank of the tooth, did you not?

A. I stated that that pivot was not enumerated as an element in the claim. That was all that I recollect of stating.

Q. 61. Taking the specifications, drawings, and patent referred to together, does, or does it not, make mention of a bolt, or pivot, through the shank of the tooth?

A. The specifications and the drawings undoubtedly show a pivot through the shank of the tooth, but, in summing up, my recollection is that it was not made an element, and I do not understand that you can include an element that is not contained in the summing up without reissue.

Q. 62. Do not the specifications themselves and the patent referred to specially mention and refer to a bolt or pivot through the shank of the tooth?

A. I say, as before, I think it does. The specifications and patent refer to the pivot through the shank of the tooth.

Q. 63. Then when you say that the defendants' device, which you have mentioned in your direct testimony, contained only three elements which are found in the plaintiffs' patent as mentioned, it is because you claim that, in the summing up of the plaintiffs' patent, the pivot is not mentioned, is it not?

A. I stated that the defendants' device did not contain the brace in the summing up in the plaintiffs' patent, and its absence left only three elements instead of four, as summed up in the plaintiffs' patent; that I did not count the pivot in the defendants' device because it was not counted as an element in the plaintiffs' device. That, in substance, was what I stated.

Q. 64. What do you understand by a brace?

A. I understand a brace, properly considered, to be a triangular support to an angle. An ordinary form is a post and a beam and a base triangle, above or below. That, in mechanics, is a brace.

Q. 65. Is a brace confined to any form, to any position?

A. In mechanics it is confined, substantially, to the form I have

stated. The term "brace" is applied to many other things outside of mechanics, even to a bracing wind.

138 Q. 66. Are these terms in reference to patents found in drawings and specifications always used by the patentee with strict regard to their meaning in mechanics?

A. They are or ought to be most clearly in my estimation, where the invention relates to mechanics.

Q. 67. In the Rowell patent in controversy in this suit, No. 2209, do the patent, drawings, and specifications call for the brace being placed at any particular point on the standard?

A. My recollection is that it states that the brace is in the rear of the standard, passing up through the drag-bar, etc.

Q. 68. In your opinion, would it be material under the patent whether the brace was in the rear or in front?

A. Broadly considered, as I have stated in reference to the Eberly and the earlier Rowell patent and Atwood, it would not be material; but specifically in a limited patent I consider it would be.

Q. 69. What do you consider the plaintiffs' patent—a broad patent or the patent of a special device?

A. I consider it a patent for a special device, with very little breadth of arrangement.

Q. 70. But you would consider any mechanical equivalent to the plaintiffs' device an infringement, of course.

A. I would consider anything like the plaintiffs' device, or substantially like, an infringement.

Q. 71. What do you understand by a mechanical equivalent?

A. I understand by mechanical equivalent, as used in patents, to be a device substantially like some other device, operating in substantially the same way, or upon the same principle.

Q. 72. Necessarily the same form?

A. Not necessarily the same form precisely.

Q. 73. Would any change of form from the plaintiffs' device which an ordinary mechanic could readily design and make be a mechanical equivalent?

A. I consider a straight brace might be put upon the plaintiffs' device—

Q. 74. Now answer my question.

A. Notwithstanding the patent says a curved brace, and still be the equivalent of the curved brace.

Q. 75. Question repeated.

A. Such a change of form as I have stated I consider would be an equivalent of the present form—a mechanical equivalent. I could mention others.

Q. 76. I don't care for them. I repeat the question.

139 Counsel for the defendants objects to the question, on the ground that it is indefinite as to whether or not the change of form would make any change in the result.

A. A mechanic might make a change of form which would be the equivalent of the present form, but you may make one that would not be equivalent, for he, of course, might change the

form of the tooth and standard so as to change the results in its workings.

Q. 77. Did I understand you to say that the brace placed in the Rowell tooth of 1869 is substantially within the purview of the patent of 1868; otherwise, where the brace could be equally placed front or back?

A. The brace of 1869 could not, in any way that I can see, be placed at the back side; that it is forked and made to work practically. But my recollection is that I took the ground on the direct examination that, in a broad sense, they acted as braces substantially alike to support the shank or standard, each being provided that the slot admit of the necessary yielding to the shank in case of obstruction, and each being calculated to support and sustain the shank in its ordinary work. I stated on that occasion that they were mechanically different, but appeared to be substantially the same.

Q. 78. I will call your attention to the Eberly patent. I understood you in your direct examination to say that the Eberly device and the plaintiffs' device were substantially alike. Am I correct?

A. It is correct so far as my saying that they contain the same elements and in substantially the same relations and to that extent were substantially alike.

Q. 79. Is the mode of construction of the two machines under the patent substantially alike?

A. They are to a certain extent, and mechanically different in other respects.

Q. 80. Does the Eberly device contain a slotted wooden beam?

A. No, it does not; but, as I stated, it had a slotted brace in lieu thereof.

Q. 81. What does Eberly claim as his invention, as his patent?

A. It does not occur to me now precisely what his claims are.

Q. 82. Is it one of his claims which he desired a patent for that the two give way and slip back?

A. I don't recollect, as before stated, precisely what his claims are without reference to the patent; but, in my answer, I only referred to his construction.

Q. 83. Shows witness his patent, asking him what Eberly claims is new and useful and desired a patent for?

A. He recites in his specifications that the tooth will give way in case of an obstruction, but I do not understand the
140 claim to cover that feature, and it is, perhaps, fair to assume that he had such a claim that was originally on it. That cannot now be determined without reference to the file wrapper.

Q. 84. Have you not just stated that you considered the place to look for a man's invention in what he claims in his patent?

A. I do not recollect stating that.

Q. 85. What did you state in reference to it?

A. I am not sure that I answered it. I am aware that a man's inventions are often considerably more than he claims; in other words, he builds greater than he knows. All he can sustain in

court is what he claims, and nothing more. There may be very much besides in his invention.

Q. 86. You state, as a matter of law, do you, that he can sustain nothing more in court except what he has in the language of his specifications as his claim?

A. I have always understood that a man could get no more under his patent than his claim enumerated.

Q. 87. Does not Eberly provide in his patent for an adjusting tooth by means of a triangular piece of iron placed in a triangular hole of the brace therein referred to against the shank of the tooth which passes through this triangular hole in the brace?

A. I believe that he does so provide.

Q. 88. What is the triangular piece of iron for, so placed as described in the patent?

A. Mainly for a brace to support the shank or standard I suppose.

Q. 89. Question repeated.

A. I will add to that answer: The triangular form of the brace where it encircles the standard is for the purpose of turning the shovel to the right or left by wedges.

Q. 90. When this triangular wedge has driven in against the shank of the tooth in this triangular hole, does it or does it not hold the shank of the tooth rigidly in position?

A. I suppose it would to some extent.

Q. 91. Does not Eberly state that it will in his patent and specifications?

A. He may so state, but he also states that the tooth will retire when it encounters an obstruction.

Q. 92. Will this tooth and brace, as thus adjusted rigidly by means of the triangular wedge and the tooth, slip back when meeting an obstruction without disarranging the form of the brace?

A. He says in his patent that it will, and I have heard him testify on the stand that it would, personally.

Q. 93. What is your opinion about it?

141 A. I will go on further; and I have seen it tried in a full-sized plow, and it did go back, notwithstanding it was wedged sufficiently tight in the triangle to sustain the shovel in any direction desired.

Q. 94. Did not the brace move in such case, and will it not move in such case, up or down the shank of the tooth when it slides back when you have stated?

A. My recollection is that the brace slid up somewhat on the tooth as it was drawn back with force.

Q. 95. Now, when the brace and tooth are fastened rigidly by means of this triangular piece of iron, can this tooth slip back without disarranging the parts of the machine, to wit, the brace and shank of the tooth?

A. As I before stated, it did do so under a trial by Eberly himself.

Q. 96. Did you not also just now state that the brace moved up on the shank of the tooth at the time of the trial?

A. I did state that the brace moved up more or less upon the

shank of the tooth, and in that way it would relieve the tooth and allow it to retire.

Q. 97. Then the brace and tooth was not fastened rigidly by means of the triangular piece of iron, was it?

A. They were fastened measurably rigidly; as rigidly as Eberly said he found it was necessary to fasten them in use.

Q. 98. Does Eberly say such a thing in his patent?

A. He said this at the trial.

Q. 99. Does he say anything about it in his specifications?

A. There is nothing of the sort said in his specifications.

Counsel for plaintiffs: I stop here to ask to have stricken out all that the witness says he has heard Mr. Eberly say. I think Mr. Powers knows better.

Q. 100. Is the slot described in the Eberly patent on the brace held in the same manner and by the same material as in the Rowell device in question?

A. It is held by a clamping bolt, and in the same manner so far as one of said braces is concerned, where it comes in contact with the wood, but, on the other side, it is in contact with metal, and to that extent the modes are different.

Q. 101. Do you know how extensively the device of Eberly is in use?

A. I do not, but suppose it [is] not very extensively in use at the present time.

Q. 102. Has it not, in fact, gone out of practical use?

A. My opinion is that it has, notwithstanding that it contained the elements of the cultivator invention of the present day.

Q. 103. Which, in your opinion, is the cheapest tooth to manufacture, the brace and shank in the Eberly device or the device of the plaintiffs?

142 A. I think the plaintiffs' would be the cheapest to manufacture.

Q. 104. Considerably so?

A. Considerably so. However, when a single tooth is applied to the beam upon the Eberly plan, the difference would be little or nothing between it and the plaintiffs' device.

Q. 105. Don't you think that it would cost more to make the brace and clamping arrangement of the Eberly device than it would that of the plaintiffs, admitting that the shanks of both are of the same size?

A. As before stated, the Eberly device, when applied to one beam, becomes a simpler device altogether than in the construction where two are applied to the same beam, as in the patent; and, as before said, when applied to one beam I do not consider they would cost very much more than the plaintiffs' device, though perhaps some more.

Q. 106. State whether, in your opinion, the Rowell tooth in question is not a better and simpler device than the Eberly device.

A. I should think that it was a better and simpler device for a seeder where only one shovel to the drag-bar is used, but upon a

two-shovel cultivator it might not be any better or simpler, or even so good.

Q. 107. Are not the two devices in their construction different?

A. They are not identical in their construction, as I have before stated, but only broadly the same.

Q. 108. State whether or not, in your opinion, the plaintiffs' device in question is not patentable as a device.

A. I should presume it might be as a specific device, as I see nothing in the state of the art strictly like it.

Q. 109. What do you understand by a combination patent?

A. I understand a combination patent to be the combination of two or more elements in a practicable working shape.

Q. 110. Is it necessary that the elements of any of them should be used?

A. I suppose they may be all old if the combination is new, or they may be partly new and partly old, or they may be all new, though that is a very rare case nowadays.

Q. 111. Do you consider the slot in the beam on the plaintiffs' device similar in construction with the slots in the brace of the Eberly device?

A. I consider them substantially the same and working substantially the same.

Q. 112. Do you consider them similar in construction?

A. No; they are not similar in mechanical construction.

Q. 113. Does the brace in the plaintiffs' device, in passing through the slot, operate in the same way as in the Eberly device?

A. It operates in the same way, so far as being held and
143 secured by friction is concerned, and slides in nearly a parallel direction in both cases; I see no reason why they do not operate in very much the same way.

Q. 114. You have stated that the elements in the Eberly device were the same in number, and substantially the same as in the Rowell device, have you not?

A. Yes, so far as the issues in this case are concerned. Of course I make no reference to the triangular loop.

Q. 115. What are the issues in this case, and how did you learn them?

A. I understand the issues in this case to relate to the construction of a seeder beam and the tooth or shank in connection with it, and I have learned what they are by reading the papers in the case and the patents.

Q. 116. Is the beam of the plaintiffs' device constructed similarly with the beam of the Eberly device?

A. I have before stated and now repeat that I consider it is in a broad sense.

Q. 117. Has the beam in the Eberly device any slotted beam?

A. No; but it has a slotted brace, and, as I before stated, a slot is considered the equivalent of a slotted beam.

Q. 118 Is the Rowell tooth attached to the beam in the manner that the tooth is attached to the beam in the Eberly device?

A. Yes; so far as being pivoted loosely to the beam is concerned by allowing it to swing forward and back.

Q. 119. In other respects not?

A. It is attached by an eye-bolt extending out some distance from the side of the beam in the Eberly, while it is pivoted in the center of the beam in the Rowell device. In these respects they differ.

Q. 120. Do you persist in saying that the construction of the beam and the attachment of the tooth to the beam in the Rowell device, the manner of construction is the same as the beam attaching the tooth to the bar in the Eberly device?

A. I persist in saying that they are substantially alike in their construction and operation, elements and combinations.

Q. 121. May not one of the elements in a combination patent be so made in simplicity and manner of operation as to be patentable?

A. Very possibly an element in a patent might be so made or changed, or enlarged in its scope or functions, as to constitute ground for a new patent; but, as before stated, merely a perfecting element without material change would not warrant new patentability, as I understand the matter. However, I do not pretend to be a patent lawyer.

Q. 122. Would the removal of the brace from the rear end of the Rowell tooth, the front attachments being the same, to the beam, in your opinion, constitute the infringement of the Rowell patent?

A. It would strike me that the removal of the brace to the
144 front merely, all other things being the same, it might be held to be the same invention still, notwithstanding the patent recites that that is where they are located, and that they have found it the best way, and one of similar ways employed to construct and operate this tooth. The specifications recite that their construction is "of very simple construction, and has been found more effective, practically, than other devices designed to operate in a similar way." Perhaps putting the brace forward is one of the similar ways they have in contemplation, but, as I before stated, I should not consider the shifting of the brace forward, everything else remaining the same, to be a new invention.

Q. 123. Suppose in the Rowell exhibit referred to the brace should extend over in a curve and meet and form a part of the shank in the tooth; would it constitute any material change of the patent, or would it be substantially the same?

A. Everything else remaining the same, I do not see how the carrying it over in that way would affect its operation. There would be a departure from their shown and described manner of doing it.

Q. 124. Suppose that the brace should be carried over in a curve, in a curved form to strike the former part of the shank of the tooth in the Rowell device in question, and then the shank of the tooth cut out from where the brace joins it near the foot up to the beam; would that materially change the tooth under the Rowell patent?

A. I think in such a case the brace would be removed from the tooth, or the standard would be removed, and the brace would constitute the standard.

Q. 125. Would not a portion of the standard be there still in the case just put?

A. I think not. A portion would leave the tooth strong enough to operate. It would strike me as a very defective construction.

Q. 126. Would not that portion of the shank of the tooth which passes through the bar still remain attached to the curved brace?

A. If the shank was cut out below the beam what was put in the beam, of course, would remain attached to the curved brace; but, as before stated, such a curved brace, with the standard removed, would not be formed in a way to have strength. Or to such a tooth as is shown in the Rowell device, it would be a different tooth. It would be a tooth without a standard, or a standard without a brace, one way or the other, as it would stand upon one leg instead of two.

Q. 127. You said it would not be so strong; why would it not be stronger, being left in such a form, than it would if run up straight? It would be on a curve, therefore bracing to some extent, would it not?

A. I said it would not be so strong, because the brace is obviously of considerably smaller iron than the standard. I did not say that a stouter brace could not be put there, but was speaking of the one that was there.

145 Q. 128. Provided the brace was made the same size as the shank of the tooth, will it not be as strong, or even stronger, in that form than it would be with a single upright standard with no brace?

A. Very likely a tooth might be made strong enough upon that plan.

Q. 129. Would it not be stronger if made of the same size as the shank of the tooth described as made of now?

A. I think not, because it is considerably longer, running back at an angle.

Q. 130. But would not the curved form of the tooth more than balance the little difference in their length?

A. It would represent a double curve when cut as suggested, and would not, unless made considerably heavier, be as strong as it is in its present form with the vertical standard and back brace.

Q. 131. Suppose the tooth was made out of a single instead of a double curve, so as to make the shank of the tooth as now shown in the plaintiffs' device, would it not then be as strong, or stronger, to resist the backward pressure than now with the beam cut out as before mentioned?

A. I think its additional length would require additional weight of metal, notwithstanding the diagonal shape in which it would extend.

Q. 132. How much longer would you compute it to be?

A. Somewhat longer; and being longer without additional strength, whether little or much in the same proportion, it will be weaker.

Q. 133. If the shank was cut out of the plaintiffs' device, as before mentioned, and the brace carried over to the top as described, would

it not be very similar to the form of the defendants' device in question?

A. No, I think not.

Q. 134. What would be the difference?

A. The difference would be that it would have an irregular line, not being straight, and the brace being of smaller material, would not have the requisite strength of defendants' device.

Q. 135. Could not, however, a mechanic of ordinary skill, seeing those defects which you have just mentioned, readily construct a straight beam and tooth with a straight shank like the defendants' device?

A. I think he could after he had the defendants' device to look at, but it might not occur to him otherwise.

Q. 136. Do you think it would naturally occur to a mechanic of ordinary skill and intelligence to make it straight to overcome such defects—to make the shank of the tooth straight to overcome such defects?

A. It might occur to a mechanic of ordinary skill to make the shank of the tooth straight, but at the same time it might not occur to him to make a top surface. To make that would afford the requisite friction to keep it in position.

146 Q. 137. But we have been talking, have we not, of a tooth having the top surface with the necessary friction that you speak of in all these questions and answers?

A. I understand that we have been talking about the plaintiffs' tooth with a brace carried over, supposing something that at the time of the invention of the complainants' tooth probably had never been thought of, much less done, by anybody as far as I know.

Q. 138. We have been too long. I ask you if that is not so?

A. So far as we know, I say.

Q. 139. Is the device which has been offered in evidence, and marked "Eberly's Tooth and Beam," constructed after the drawings and specifications of the Eberly patent?

A. No, I should not think so, strictly. No, it is not, strictly.

Q. 140. Is the shank of the tooth attached in this exhibit referred to attached in the same manner as it is described in the Eberly patent?

A. No, it is attached in the exhibit directly to the side of the beam. Yes, it shows for itself, or, as in the Eberly patent, there it is sustained outside of the beam with an eye-bolt.

Q. 141. Is the brace in the exhibit referred to attached to the standard of the tooth in the same manner as it is described in the Eberly patent?

A. I consider it in substantially the same manner so far as the forward and back action are concerned, but not with a triangular loop to admit of turning the cultivator tooth to the right or left, as in Eberly.

Q. 143. Do you consider the device for holding the tooth to the beam in the exhibit marked "Eberly Tooth and Beam" as good for the purposes designed as defendants' device for holding the tooth to the beam?

A. It does not strike me as being as simple and good in all respects, although I see not why it should not be effectual, except that it should be applied to the center of the beam, as the beam is made, in order to work properly.

Q. 143. Do you know who designed that particular device?

A. No, I don't know anything more than I see it before me.

The further taking of this testimony was adjourned at this point until Tuesday morning, at 10 o'clock, September 9, 1879.

The further taking of this deposition was resumed on Tuesday morning, September 9, 1879, at 10 o'clock.

Q. 144. Question by Mr. DICK: You stated yesterday, I believe, that you had examined and seen the Eberly plow at work, did you not?

A. I stated that I had seen the Eberly tested as to its giving back, but not at work in the field.

Q. 145. In the plow that you saw so tested was there a hole in the shank above or below the brace?

147 A. I do not recollect now about any hole in the shank. I simply recollect that it gave back in order to allow it to go over an obstruction.

Q. 146. Will you be so kind as to answer the question, not what I did not ask? Had there been a hole in the shank, did you examine the machine particular enough to see it?

A. I would have noticed any hole in the shank at the time, but, after this lapse of three or four years, I do not recollect a thing of that sort, whether there was or was not one.

Q. 147. Had there been a hole in the shank directly above the brace and iron pin or wooden pin, would the tooth slip back on the brace to let it up from an obstruction?

A. It would undoubtedly greatly strain it. A sufficiently strong iron pin might, however, be so placed as to interfere with its slipping back more or less. A wooden pin, unless large, would be apt, under the circumstances, to break, as the clamp would be very short upon it and the force considerable.

Q. 148. If the brace and tooth in the Eberly patent were placed in position for proper working, and an iron pin passed through a hole in the shank clasping both the braces on the shank, would the tooth slip back when striking an obstruction?

A. It undoubtedly would slip back more or less, but perhaps not as much if the iron pin was so placed as to cramp its action.

Q. 149. You have examined the specifications and drawings of the Eberly patent critically, I believe you stated?

A. I have examined the specifications and drawings in the Eberly patent with usual care.

Q. 150. Then state what, in your opinion, according to the drawings and specifications, the length of the slot is in the brace in a working-machine.

A. I would judge, from the best of my recollection on that point, that the length of the slot might be six inches in a working-brace, more or less, may be more.

Q. 151. With the brace and tooth in working position, with an iron pin passed through the shank directly above the brace, would the tooth slip back in striking an obstruction without bending, more or less, the slot into the brace, at its natural position?

A. I don't think the tooth slipping back, under the circumstances stated, would bend the slot in the brace, but would be more likely to bend the brace near the triangular opening in the front of the standard.

Q. 152. Have you examined the plaintiffs' device in question and the defendants' device in question?

A. I have examined them, more or less.

148 Q. 153. Is there any difference in the mode of operation of the teeth of the two devices?

A. The mode of operation of the teeth of the two devices would be alike, so far as I can see, in acting in the ground, but, when encountering an obstruction and escaping therefrom, their operation would be different somewhat.

Q. 154. How different?

A. In the fact that the back-brace of the plaintiffs' device would be slipped longitudinally up through the clamp, while the clamping portion of the defendants' device would be slipped out from the clamp in a sweeping direction, sweeping from the axle of the forward bolt.

Q. 155. Would the manner of the sweeping of the teeth you have just mentioned affect the operation of the teeth in slipping back when meeting an obstruction?

A. I don't think the condition I have mentioned would affect the operation of the teeth materially in slipping back, but the wooden jaws would be acted upon differently in the two cases by the slipping of the tooth and brace in the one case.

Q. 156. Are not both the teeth mentioned held in position by the friction in a slotted beam?

A. Yes, sir; I think they are.

Q. 157. Will you explain how the defendants' tooth passes over more surface in the slot than does the plaintiffs'?

A. The defendants' tooth passes over more wooden surface in the wooden slot than the plaintiffs' for the fact as before stated, that the brace moves mainly in longitudinal direction, while the plaintiffs' clamped shank moves not only longitudinally, but outward, and thereby passes over considerably greater wooden surface, than does the device of the plaintiffs', at least twice as much in inches.

Q. 158. What is the distance in the respective teeth from the clamping bolt to the end of the beam?

A. Two or three inches.

Q. 159. In each one?

A. In each.

Q. 160. What is the size of the respective beam?

A. They appear to be of the same size, or nearly so.

Q. 161. Does not the plaintiffs' device in slipping back pass over the entire surface of the wood from the clamping-bolt back to the end of the slotted beam?

A. It might do so when carried very far back on the drag-bar.

Q. 262. When the two teeth are carried back in the same angle with respect to the beam, would not one tooth pass over as
149 much surface in the slot as the other; would not one device pass over as much surface in the slot as the other?

A. No, I think not.

Q. 163. What is the difference?

A. The difference appears to me to be that the defendants' device passes over the most wooden surface.

Q. 164. How much more?

A. It is difficult to determine precisely, but considerably more.

(Witness examines device.)

Q. 165. About how much more?

A. I would say from one-half to as much again surface, perhaps nearer the half than as much again.

Q. 106. When the two devices are set for ordinary work in the field, will one device pass over any more surface in the slot when it strikes an obstruction, than the other in practical operation in the field?

A. I think they would in the operation of escaping from an obstruction when in ordinary operation in the soil. Of course there is no slipping of these parts in the wood.

Q. 167. Is or is not the part of the plaintiffs' tooth, where it passes through the slot in the beam, in practical operation as it passes through the beam substantially straight?

A. It appears to me where it passes through the beam to be circular, corresponding in part or nearly to the center of the axes upon which it turns.

Q. 168. Is not the defendants' where it passes through the slot in practical operation, also circular?

A. The upper portion of the defendants' tooth is also circular where it passes through the slot at its working point, and the lower appears to me to be straight.

Q. 169. Is not the plaintiffs' tooth in working position when it passes over an obstruction, substantially pass over the surface of the slot from the clamping bolt back?

A. It passes over a portion of the slot from the clampang bolt back, and if pushed very far back would pass over the whole of it. But to the distance it is pushed back on account of obstruction usually it would only pass over part of that surface.

Q. 170. Would not the plaintiffs', by making their brace broader, enable their device to pass over the entire surface of the slot from the clamping bolt back to the end of the beam?

A. Yes, of course; by making it broad enough.

Q. 171. Is not the defendants' tooth where it passes through the slot broader than the brace of the plaintiffs' in the exhibit before you?

150 A. It is broader.

Q. 172. Then the only difference that you claim between the plaintiffs' device and that of the defendants' before you, is that

the defendants' passes over more surface in the slot than that of the plaintiffs', is it?

A. That is one difference that I claim, so far as the amount of surface passed over, but not otherwise.

Q. 173. But is it the only difference you claim, so far as the operation of the tooth is concerned?

A. That was the only difference that I pointed out, so far as the holding or letting go of the teeth is concerned. I consider there are other differences between the two teeth.

Q. 174. You refer to the mode of construction, do you?

A. I do refer to the form and character comparatively.

Q. 175. And so far as the holding of defendants' teeth in the slot and its operation in slipping back and overcoming an obstruction is concerned, the only difference between the two you speak of is, it passes over more surface in the slot?

A. The form of the defendants' tooth gives larger clamping surface generally as well as in passing over more surface in escaping.

Q. 176. Why does it give more clamping surface. Is there any other reason than that the tooth is broader and the brace than that of plaintiffs'?

A. It gives more clamping surface from the fact that the standard of the tooth is broader and also so curved at the top as to enter into the clamps to some extent, both forward and back of the clamping bolt, while the plaintiffs' clamping device is only acted upon back of the clamping bolt.

Q. 177. Do you claim that the device of the defendants' has any clamping power in front of the clamping bolt on the tooth?

A. I do claim that it is measurably clamped there, and the theory of the defendantns' tooth is that it may be clamped by both the pivoted tooth and the back bolt.

Q. 178. What force or power holds the defendants' tooth in position, and where is it applied?

A. The force and power that hold the defendants' tooth in position consists of two bolts, upon one of which it is pivoted, and by the other of which it is clamped, or, if perforated, it may be clamped by both the pivotal and the back bolt. Those forces are what I understand hold the tooth in position.

Q. 179. When the defendants' device is clamped in working position by the clamping bolt, is there any force exerted on the pivotal bolts?

A. No; not unless it is turned up tight enough to clamp it, or the tooth is moved in its position.

151 Q. 180. You say that the defendants' claim calls for the pivotal bolt being clamped strong enough to hold the tooth in position?

A. I have not so said.

Q. 181. Does it, in their specifications, drawings, and claims?

A. The specifications recite that it may be used as a clamping bolt.

Q. 182. Does it so recite when the clamping bolt itself is used, or

does it indicate it to be used as a clamping bolt when the proper clamping bolt is not used?

A. I will read the specifications, that is the best form: "The ends of the bifurcated bar are then drawn down by the bolt E or by the united action of the bolts E E, until clamped against the standard of the shovel with such force that the friction shall maintain the shovel in position while passing over mellow earth, but not so tight but that it will yield to excessive resistance before force enough is applied to break the shovel." This, I consider, answers the question.

Q. 183. When the clamping bolt proper is screwed down with force enough to hold the defendants' tooth in position for work in the field, is, or is not, the holding force applied to the tooth back or front of the clamping bolt?

A. As before stated, I consider it is applied both back and front, but considerably the most back of the clamping bolt proper.

Q. 184. In bringing the slotted beam together by means of the clamping bolt placed as it is in the exhibit before you of the defendants, at what point in the slot are the jaws of the beam the closest together, front or rear?

A. At the rear point of the jaws probably.

Q. 185. How, then, if the rear portion of the jaws are closest together, can there be any holding or binding force at the commencement of the slot when the teeth of the device are of the same thickness.

A. In compressing the jaws together the lines converge from the ends of the slot as a matter of course, and commence to clinch forward of the clamping bolt to some extent, but, as before stated, more back of it.

Q. 186. Could not the pivotal bolt in the device of the complainants before you also be sufficiently tightened for clamping purposes, and yet allow the teeth to slip back as readily as in the case of the defendants' device?

A. I do not understand the pivot in the plaintiffs' device to be a bolt, as shown and described in the patent; it is a pivot merely, and a bolt would have to be imported in the place of a pivot before it could be so used.

Q. 187. Would not the bolt in the plaintiffs' device, where the pivot now is, allow the tooth to work as readily as a clamp in the patent?

A. Yes; I suppose so.

Q. 188. Provided, then, that there was a bolt in the plain-
152 tiffs' device, used for pivotal purposes, then could it not be clamped as readily and effect the same purposes as the pivotal bolt in the device of the defendants?

A. I suppose it might be so altered and changed.

Q. 189. Or if not altered?

A. And when so done it would operate much the same in the plaintiffs' claim as in the defendants'.

Q. 190. Question repeated.

A. I see no reason to the contrary.

Q. 191. Have you in your experience ever known of, or heard of

a slotted wooden beam being used for the purpose of holding teeth, as in the device of the plaintiffs, prior to the invention by the plaintiffs, as stated in their patent?

A. I don't think of any other case except the Francisco patent of 1865. That shows a tooth held in a slotted wooden beam.

Q. 192. Does the Francisco patent show a tooth held in position in a slottled wooden beam by means of compressing the jaws against the teeth by a clamping bolt?

A. No; it does not show the tooth held in position by compressing the jaws against its sides.

Q. 193. Does the Francisco patent show the slotted beam to be used for any other purpose except to allow the tooth to slip back when striking an obstruction?

A. It is used for the purpose of carrying the teeth as the beam of a cultivator, and also serves to secure a friction plate with the clamping bolt to hold the teeth in position.

Q. 194. Question repeated.

A. It shows it for the identical purpose I have stated.

Q. 195. Does the holding of the teeth in position in the Francisco patent have anything to do with a slotted beam? Could it not be held as well without a slotted beam by being fastened on the sides of a beam by means of that?

A. I think the Francisco device could be applied upon the side of the beam, but not so simply and cheaply as through a slot.

Q. 196. And does the slot have anything to do with the holding of the tooth in position by means of a spring-plate on the end of the beam in the Francisco patent?

A. No; not especially, necessarily, that I know of. It affords a convenient place to apply the clamping bolt.

Q. 197. In the Francisco patent is the slotted beam used for the purpose of holding the teeth in position in ordinary work, and allow it to slip back when it meets an obstruction, otherwise than being fastened to it by means of a pivot fastened to the beam by means of a pivot?

153 A. The slotted beam in the Francisco patent serves to hold the tooth in position laterally, being upon both sides of the tooth through which the tooth fits properly, but the slotted beam affords no especial aid to the escaping of the teeth except that it furnishes a convenient place to apply the guard-plate upon the top of the beam.

Q. 198. Does the slot in the beam of the Francisco patent afford any power holding the tooth in position, except the pivot holding the tooth in position?

A. Yes, as before stated, it holds the tooth in position laterally, by its sides, through which the tooth fits; but no especial power as to the front and back motion.

Q. 199. Does it afford any power as to front and back motion?

A. I should say none. No, I consider it affords no power.

Q. 200. Do you, or do you not, consider the device of the plaintiffs in evidence an improvement over that of the Francisco patent in

holding the tooth in position, allowing it to slip back when meeting an obstruction?

A. I should be of the opinion that the device of the complainants was preferable comparatively.

Q. 201. Is it not cheaper to manufacture also?

A. Yes, I should say it would be cheaper to manufacture.

Q. 202. Is it not more simple also?

A. For cheapness and simplicity I should consider it preferable.

Q. 203. Do you consider the defendants' operation more preferable also?

A. I think the Francisco device might operate as perfectly and be quite as durable, the metallic surfaces slipping together, and, further, the Francisco tooth will go forward more readily than the device of the plaintiffs' in backing the machine.

Q. 204. Is it not an object to have the tooth slip forward in practical operation in the field in backing?

A. I am of the opinion that it has been held to be a convenience and a merit, and should presume it might be such, to some extent, though not indispensable.

Q. 205. Do not all these seeding-machines now have a mode of raising the teeth by means of a lever or otherwise when they wish to back without changing the position of the tooth?

A. I think it is common to have an elevating lever for that purpose.

Q. 206. Do you not think that elevating apparatus raising the tooth preferable to have them slide forward when they back?

A. It may be or may not. I see no objection to the tooth sliding forward if they are so weighted that they will return to their work for a certainty when the machine goes forward again.

154 Q. 207. If the teeth slip forward when they back, would they not have to be adjusted in position again when they move forward to their work?

A. I understand that they return to their place automatically. It should be noticed that the Francisco tooth is so weighted that gravity would, most certainly, return it to its place.

Q. 208. Would it not be more liable to get out of order by being forced backward and forward in the way you mention, and would not the device be more readily worn out?

A. No, I should think not.

Q. 209. Do you consider the device in the Francisco patent similar to the device of the plaintiffs before you, so far as the tooth and the holding of the same are concerned?

A. Oh, broadly, they are similar. The Francisco patent is held in position by a device that gives way when obstructions are encountered, not just as in the plaintiffs' device, but the guard in both cases is held by friction and a clamping-bolt, so that there is quite an analogy between them. The teeth in both cases are also hung in a wooden slotted drag-bar. In several respects they are quite analogous.

Q. 210. If you cut off the top of the Francisco loop and put your

pivot forward, you have plaintiffs' shank and brace almost complete, have you not?

A. The Francisco shank and tooth are quite suggestive of the complainants' both as to its wooden drag-bar and as to its form and adaptation.

Q. 211. Does not the spring-plate in the Francisco patent afford a direct resistance to the slipping back of the tooth, aside from frictional pressure?

A. I think not. The leverage of the tooth, turning upon its pivot, acts directly upon the plate and forces it forward under its frictional clamping-bolt.

Q. 212. Does not the spring always afford direct pressure to a certain extent?

A. I don't think the clamping device operates much as a spring, if at all, but as simply a plate, held under a clamping-bolt and under a guard staple intended to be forced forward by the leverage action of the tooth when the obstructions are encountered at the lower end of the tooth.

Q. 213. If you should cut off the top of the loop in the Francisco tooth and place a pivot through the front as in the plaintiffs', as you have mentioned, would not such a tooth be constructed according to the drawings and specifications in the Francisco patent?

A. No, of course not?

Q. 214. Then it would be a change from the Francisco Patent, would it?

155 A. Yes. What I assumed was that it would be a change substantially from the Francisco patent to the patent of the plaintiffs', so far as the tooth was concerned.

Q. 215. And then it would operate with such change differently as to its holding power from what it would in the Francisco patent?

A. Yes; the holding power in the Francisco patent would not operate as well after such a change. It would clearly operate to some extent, perhaps to a sufficient extent.

Q. 216. Do you know whether teeth are now made under the Francisco patent?

A. I do not.

Q. 217. Is it not a fact that such teeth are no longer made, and that the device of the plaintiffs has taken their place?

A. I am of the opinion that the Francisco tooth is not much, if at all, manufactured, and that other devices resembling it, more or less, have taken its place, other measurably improved devices over that one.

Q. 218. Has the plaintiffs' device, and similar devices, taken the place of the Francisco device?

A. I presume they have to quite an extent; yet I do not know but that the Francisco tooth is still made in some portions of the country.

Q. 219. In your varied experience of twenty years in manufacturing and selling, have you seen, to any extent, lately, teeth or machines with the tooth of the Francisco patent?

A. I have not for a dozen years or more.

Q. 220. What is the cam-like face for in the Francisco patent?

A. I suppose it is to retain the tooth measurably in position as it goes back.

Q. 221. In your opinion, is, or is not, the plaintiffs' device, as a device, patentable, so far as the device of the Francisco patent is concerned?

Counsel for the defendants object to the question unless it has reference to the state of the art at the time of the application for the plaintiffs' patent.

A. I presume it would be held an improvement or perfecting patent on the Francisco device, and earlier devices.

Q. 222. If the bolt which holds the Francisco tooth in the beam had been placed inside of the curve of the Francisco tooth, would it be like the plaintiffs' device?

A. I don't see how it would be identically like it, or substantially like it.

Q. 223. If a set-screw was placed through one of the set-jaws of the slotted beam of the Francisco patent against the side of the tooth, pressing against the sides of the beam, would it be like the plaintiffs' device?

156 A. If the set-screw were applied to the front part of the tooth, opposite to the axle pivot, it strikes me it would be considerably like the plaintiffs' device, not mechanically, but operating the same practically, as the tooth would be pivoted upon one limb of the fork of the plaintiffs' device and held by the other. In the case suppose the brace against which the set-screw would act would be in front of the standard instead of the rear, as in the plaintiffs' device, but that, as I have before stated, I do not consider would make any very material difference in the principle or operation of the device.

Q. 224. Then you do not consider any change of that sort to be anything more than a mechanical device which would readily suggest itself to any mechanic of ordinary skill, do you?

A. I have before stated that I did not consider the putting of the brace in complainants' device forward instead of back would be a patentable change; it would still remain, other things being conformed to it, substantially the same invention.

Q. 225. Question repeated.

A. I consider some changes involve inventions and others to be merely mechanical changes. I do not remember that I said, nor do I now say, that a radical change of the Francisco tooth to the character and arrangement of the plaintiffs' tooth would only be a mere mechanical change.

Q. 226. If such change as you have spoken of in reference to the Francisco patent placing a set screw in front against the curve of the tooth is only a mechanical change, not affecting the merits of the invention, is the change a form of the defendants' tooth over that of the plaintiffs', anything more than a mechanical change not effecting the invention?

A. I am not aware that I said that such a change in the Francisco tooth would only be a mechanical change. I said, in answer to the question, that, if such and such things were done, it would operate so and so. That was the extent of what I did say. And what I said in relation to these possible changes in the Francisco tooth do not carry the idea, in my mind, that such a radically differently made shank and tooth as the defendants' would only be a mechanical change as compared with the Francisco or the plaintiffs' device in this case.

Q. 227. Do you claim that such a change as you have mentioned in the Francisco tooth, placing a set-screw against the curve of the tooth, is, or is not, simply a mechanical change affecting the character of the invention?

A. I am of the opinion that it would be held to be more than a mechanical change to have made those alterations.

Q. 228. Not an equivalent to the plaintiffs' device?

A. Such a change, if made, as I have before stated, and
157 everything else adopted, operating to put the brace merely forward instead of back, as in the plaintiffs' device, would be an equivalent to the plaintiffs' device.

Q. 229. Would such a change?

A. State what kind.

Q. 230. You have mentioned it. Would the change you have spoken of in the Francisco patent, to wit, putting a set-screw against the front of the tooth through one of the jaws of the beam, be equivalent to the device of the complainants before you?

A. As before stated I consider it would be, in a broad sense, substantially like the plaintiffs' device. I repeat that answer. For it would be composed of a slotted wooden beam with a practically braced shovel-standard inserted in its slot, pivoted upon one limb of the brace, and held in position by a set-screw bolted upon the other limb. It strikes me it would be a construction substantially like the plaintiffs' device, but not identically like it.

Q. 231. If the Francisco tooth was held in position by a set-screw passing through one of the jaws of the beam against the front of the tooth, the pivot remaining in position, the patent describes, or inside of the curve even, would the operation of holding the tooth be similar to that of the plaintiffs' device?

A. No; if the pivot were inside of the curve, because it would be no pivot at all in that case. The tooth would be left to swing free in the pivot.

Q. 232. In case it passed through the rear end of the tooth, as described in the Francisco patent, how would it be then?

A. If it were pivoted, as shown in the Francisco patent, and the set-screw applied to one of the jaws of the beam to the front limb of the standard which answers for a brace, it would, as I stated, be substantially identically like it.

Q. 233. In such a case would the slotted beam be similar in its operation to that of the device of the plaintiffs?

A. In a broad sense it would be similar; in a more specific sense it would not.

Q. 234. In the case referred to would not the slot in the Francisco beam be substantially a mortise instead of a slot through the end of the beam?

A. It would be a long mortise or slot, not reaching, of course, to the end of the beam.

Q. 235. Do you consider the operation of the mortise holding the tooth to be as effectual, and as simple, and as cheap to manufacture as a slot to the end of the beam?

A. A long slot would clamp a tooth as effectually with both
158 ends closed as an open slot, and one can be made nearly or quite as easily as the other, with proper tools.

Q. 236. Do you mean to say that a mortise can be made through a beam as easily and cheaply as a slot in the end of a beam?

A. I mean to say that it can be made nearly or quite as easily, and with a small tool, the wabbling saw. In making such mortise the stick is to be brought up or down to the saw instead of being pushed under it, and is an every-day occurrence in manufacture.

Q. 237. Do you consider a mortise through a beam holding a tooth in position to be similar in position to a slot in the end of a beam holding a tooth in position?

A. It is similar, so far as objects and results are concerned, when it is made long enough, so that the two parts can be readily compressed toward each other, and, in the nature of things, affords a more substantial construction than a slot in the end.

Q. 238. In your opinion, is the device of the plaintiffs' before you an infringement of the Francisco device shown as in the patent, so far as the holding of the tooth is concerned?

A. I do not consider it my province as an expert to determine what does or does not infringe, and would be trespassing upon the province of the court in so doing.

Q. 239. Do you consider a set-screw placed against the tooth holding it in position as good as a clamping-bolt as in the plaintiffs' device?

A. Its application is not usually as simple, but when properly done it is as fully effectual, if not more so.

Q. 240. Do you consider a brace held in position between iron jaws or slots as effectual as held in position by means of wooden jaws or slots?

A. I consider it would be more effectual.

Q. 241. You consider it would work better, practically, do you?

A. I consider it would work as well, practically, if it were properly constructed, and probably better, and as durable.

Q. 242. Will you please tell me, then, why the method of holding the tooth in seeding machines is now almost universally by means of clamping the tooth between wooden jaws?

A. One of the reasons is that it brings the tooth in the center of the beam, which is very desirable. Another is, that wood in this country, where it will answer the purpose, is much cheaper than metal, both in its first cost and in its manufactory.

Q. 243. To hold the Francisco tooth in position by means of a set-

screw, as you have before mentioned, would be to change the construction of the tooth in reference to its claim, would it not?

A. I do not see how it would change the construction of the tooth. It may change the elements of the combination in his claim.

159 Q. 244. Would, or would it not, be a change in the method of constructing and operating the Francisco tooth?

A. It would be a change in the method of construction of operating it, but the mere tooth I have supposed to remain the same as it is.

Q. 245. May not a change of form of part of a machine be the basis of invention?

A. It might be where form was the subject-matter of invention, but a change of form that produces no new results would not be considered a new invention, as I understand it.

Q. 246. If a machine or a device produces an improved product or result, is or is it not patentable?

Counsel for the defendants objects to the question, on the ground that the answer depends upon the circumstances of the case, and cannot be decided abstractly by any man, lawyer or otherwise.

A. If it produces a better result by a new means, it would be patentable perhaps; but, producing a better result from a better handling of a machine, or working of it or adjustment of it, would not be patentable, of course.

Q. 247. If a new effect is produced by a change of form and proportion, is it patentable?

A. That would depend upon what the subject of patentability was; if effect and form were the subjects, as in this case, perhaps it might be so.

Q. 248. If a new effect is produced by a change of form and proportion in a machine, is it patentable?

Counsel for the defendants objects to the question, for the reason heretofore stated.

A. It might or might not be, depending upon circumstances.

Q. 249. If the substitution of one material for another involves a new method of construction, may it amount to an invention or not?

A. It may amount to an invention as to the process, if involving a new process of construction.

Q. 250. If the substitution of one material for another in a machine involves new modes of construction, may it amount to invention?

A. It may or may not, depending on circumstances; supposable cases have to have supposable answers.

Q. 251. Is the production of an old result by new means patentable?

A. Means for doing things, as I understand it, is what is patentable; results are not patentable; hence a means materially new in principle and operation would be patentable, whatever the result might be.

Q. 252. Is it an element of invention for one to be the first to make the application in a particular manner?

160 A. I hardly see how the time of applying would constitute an element.

Q. 253. Not the time of applying; read the question to the witness.

A. I understand whoever is first in applying a principle in a particular manner for a new and useful result is an inventor to that extent.

Q. 254. Is it an element of invention for one to be first to make a new application of an old principle?

A. I so consider it.

Q. 255. Is it also an element in invention to be the first to show how the device can be made and applied?

A. I consider that would be a step in the direction of invention, if it were a new device, or any new application of an old device.

Q. 256. Is it also an element in invention to show there is utility in making the device?

A. I understand that utility is required in a device in order to render it patentable; that merely curious things are not patentable.

Q. 257. When is a device the same in substance or in principle as any other?

A. When it operates upon the same principle, or substantially upon the same principle, or in the same manner, or in substantially the same.

Q. 258. You have had before you in your direct examination two patents of the complainants, have you not—called No. 1 and No. 2, have you not?

A. Yes, I so understand it.

Q. 259. In the reissue of Rowell patent of 1862, dated 1869, designated No. 1, is there any change in the form of the tooth in the reissue over that of the original patent of 1862?

A. I am not aware that I am familiar with the original patent; if I am furnished with the original I will make the answer; but I know nothing about the original, as a matter of fact, in this case, but my impression is that there is no change.

Q. 260. Then do you consider the tooth mentioned in the plaintiffs' reissued patent of 1869, offered in evidence heretofore, to be the same in principal as the plaintiffs' tooth and beam in question, before you?

A. Yes, in a broad sense, but not in a limited sense.

Q. 261. In such sense that one would be an infringement of the other?

A. No; I should consider not.

Q. 262. In a combination patent, is it necessary for the patentee to be the inventor of any of the elements in the combination?

A. No, I suppose not.

Q. 263. Have you critically examined the patent, drawings, and specifications of the Atwood patent?

A. Yes, I have examined them with a fair degree of care.

161 Q. 264. Have you examined the exhibit marked "Atwood Plow?"

A. Yes, sir.

Q. 265. Is such exhibit made in accordance with the drawing and specifications of the Atwood patent?

A. I think it is.

Q. 266. What is the claim made by Atwood in his patent referred to?

A. My recollection is there are three or four claims.

Q. 267. With references to this exhibit?

A. I could not recite the substance, even, of them, without looking at the patent.

(Patent shown to the witness.)

Q. 268. State what the patentee claims with reference to this exhibit.

A. The first claim relates to the forward connection between the beams and the frame.

Q. 269. I am not speaking of that. Only that portion which bears on the claim.

A. The fourth claim is: "For the combination of a strap piece, *c*, and a set screw, C, with a beam, H, and with the braces, H 3, as and for the purposes set forth."

Q. 270. What part of the drawings and specifications described the exhibit referred to? State fully the language of the patent.

A. I quote from the specifications as follows: "The plow-post, H 2, is fastened to its beam by a single bolt, *d b*, so that the lower end of it may swing backward or forward as may be required to accommodate the length of the brace, H 3, which is fastened to the post by means of a bolt, *d'*, which admits a like longitudinal motion. The upper end of the brace, H 3, passes through a strap-piece, *c*, attached to the rear end of the beam, H, and is there secured by means of a set screw, *c'*. The brace, H, may be adjusted so as to place the plow more or less forward, thereby throwing the point of it more or less elevated, and then the parts thus adjusted secured in position by tightening the set screw, *c*." This is what I find more immediately to the point upon the subject in question in his specification.

Q. 271. What are the uses and purposes mentioned in the claim of the patentee, and in the language of the specifications?

A. I locate the claim fourthly, the combination of the strap-piece, *c*, and set screw, *c* I, with the beam, H, and with the braces, H 3, as and for the purposes set forth. This is the language of the fourth claim of the patent that relates to the device in question.

Q. 272. State whether or not the patentee in the Atwood patent, either in his patent or specifications or drawings, makes mention of or claims any slipping back of the plow when striking an obstruction in order to give way and pass over without breaking.

162 A. I don't find that he does mention any function of that sort in language.

Q. 273. Of what kind of materials do you find the exhibit made of? First, what is the plow-beam made of?

A. Of wood.

Q. 274. What is the plow-post and strap made of?

A. Iron, apparently.

Q. 275. Wrought or cast?

A. Wrought iron.

Q. 276. What is the brace made of?

A. Wrought iron, apparently.

Q. 277. What is the strap-piece on the end of the beam through which the brace passes made of?

A. Cast-iron.

Q. 278. Will you describe the form and construction of the strap-piece at the end of the beam through which the brace passes?

A. The form of construction of the strap-piece through which the brace passes has an enlarged rear end with an extension, originally one, before broken, of a wedge-shape, extending under the beam with bolt holes through it to secure it to the beam. The enlarged outer end of the strap is mortised vertically with a neck-shaped mortise so at to admit of a rod rocking forward and backwards in it to a considerable extent. These are the principal features that occur to me.

Q. 279. Is this strap-piece closed at the rear; and, if so, how?

A. It is closed at the rear by metal, being welded at that point.

Q. 280. What is the size of the strap referred to?

A. The outward end about two and one-half inches square, but a little wider than deep, and the near end about two inches and a half wide, and from an inch and a quarter to five-eighths of an inch at its original end before being broken of, to appearances, there being a jaw in the top of the strap not before mentioned.

Q. 281. What size is the hole through which the brace passes?

A. A little more than three-fourths of an inch in width and about two inches and a half wide at the top and bottom sides of the strap, but narrowing at the centre, as before stated, in a neck-shape, so as to keep the brace in a central position, however angling it might be in the mortise, thereby securing the brace in the right position to be acted upon in the set-screw.

Q. 282. Is this hole through the strap on the end of the beam in resemblance of a mortise, or is it in fact a mortise?

A. It does not resemble a mortise in the ordinary sense, but still it would probably be considered a mortise as nearly as any other specified form.

163 Q. 283. How thick are the sides of the mortise?

A. About three-quarters of an inch.

Q. 284. The same in the rear?

A. Somewhat thicker than three-fourths on the set-screw side, and an average thickness in the rear of an inch and a quarter, perhaps. Perhaps not more than an inch average thickness.

Q. 285. How is this plate or strap fastened to the beam?

A. It is fastened to the beam by a bolt, and appears to have been originally fastened by two bolts before the end of it was broken off, the strapping being applied to the other side of the beam.

Q. 286. What do you call the plow-post in this exhibit?

A. I should consider it a standard.

Q. 287. A plow standard?

A. Yes, as the most correct name.

Q. 288. Is the plow-post in the exhibit referred to fastened and held to the beam in the same manner as the Rowell tooth and beam in the one now before you?

A. Not identically in the same manner, but substantially the same. It is held by a single pivotal bolt, but the standard does not pass through the wooden beam. On the other hand, it passes up the side of the beam, and has a strap on the other side of the beam, so that it may embrace and clamp the beam instead of being embraced and clamped by the beam as in the Rowell.

Q. 289. Is there any slot in the Atwood exhibit through which a plow-post passes and is held by compressure of the pivot against the beam?

A. No; there is no slot in the beam of the Atwood plow through which the standard passes.

Q. 290. In what place does the Atwood exhibit strike the plow-post?

A. Partly down towards the bottom of the share of the plow?

Q. 291. How is it connected with the plow-post?

A. By a bolt. It is connected loosely, so that it has a free joint for forward and backward movement.

Q. 292. Does this brace connect with the plow-post in the same manner as it does in the Rowell tooth and beam?

A. No; it is not welded on to the plow-post as in the Rowell.

Q. 293. Does the brace in the Atwood exhibit pass through the slot in the wooden beam as in the Rowell tooth and beam?

A. No; not through the slot in the wooden beam, but through its equivalent in an attachment to the rear of the side of the beam.

Q. 294. How is the brace in the Atwood exhibit held in the strap-piece?

A. By a set-screw upon its side.

164 Q. 295. In the Atwood exhibit is the brace held in the strap-piece by compression of the sides of the strap-piece against the side of the brace?

A. No; not by compression between the two sides of the strap-piece, but by compresssion upon one side of the strap-piece through the instrumentality of a set-screw.

Q. 296. Will the sides of the strap-piece through which the brace passes in the Atwood exhibit be drawn together by means of the clamping-bolt, to hold the brace?

A. No, I should say not.

Q. 297. Are not the sides of the mortise through which the brace passes in the Atwood patent in the strap-piece rigid and not capable of compression?

A. Yes; they could not be compressed with any reasonable force.

Q. 298. Is not the strap-piece in the Atwood exhibit more liable to breakage than the slotted beam of the Esterly device?

A. It is of more brittle material than wood or cast-iron; but, if made sufficiently strong, would not be likely to break.

Q. 299. If made sufficiently strong to obviate breakage, would it not make a seeder consisting of thirteen teeth with their beams too heavy for practical operation?

A. I think not; in a seeder, of course, it would be materially less bulky than in a breaking plow. Besides, it is a fact that a seeder needs a certain amount of weight upon the beam to keep the teeth in the slot.

Q. 300. Can you keep the tooth of a seeder in the slot by inclining the tooth more or less as readily as by additional weight on the beam?

A. They can be kept by inclination of the teeth, I suppose; but, as before stated, a certain amount of weight there, such as would be required for a seeder shovel, would not strike me as being liable to be objectionable from overweight.

Q. 301. Are not the seeder teeth kept in their position in the ground deeper or shallower usually in seeding-machines by inclining the teeth more or less?

A. That is one way of keeping them in the ground.

Q. 302. I ask you if it is not the usual way?

A. But I believe a good many claim to govern the depth by the chains.

Q. 303. In regulating the running deeper or shallower by means of chains, is that not in effect inclining the tooth more or less for the same purpose?

A. In limiting the depth with chains you would need to have weight, or weight and inclination of the teeth, sufficient to make them run into the ground, because the chains would only control them one way. You could not bear down upon the shovels any additional weight with the chains.

165 Q. 304. Question repeated.

A. Lengthening the chains would increase the inclination of the teeth by the swing-bar more or less.

Q. 305. Do you consider the construction of the exhibit marked Atwood Plow the same as the complainants' exhibit marked Tooth and Beam?

A. I do consider them substantially alike, and even substantially identically alike, but not absolutely identically alike.

Q. 306. Are they constructed the same?

A. They are not constructed identically the same. If they were, the principle of the two is near enough alike to be identically the same. The difference I find between them is in the construction of the parts, and not of principle.

Q. 307. What parts are constructed differently in the two exhibits?

A. The standard in Atwood is applied to the beam outside, as I before stated, and the back-brace passes up through a kind of mortise, and is secured there by a set-screw, as before stated, instead of the parts being secured in a slotted wooden beam, as in the plaintiffs' device. These differences of construction are really apparently all the differences that are between them. I will add that the brace in the Atwood is hinged so that it can swing, while in the plaintiffs'

it is curved so as to work when rigidly welded to the standard; but these are only minor differences of construction.

Q. 308. Is not that portion of the exhibit which holds the brace constructed of a different material?

A. Yes; and would have to be in using a set screw. The set screw would have to be used in a metal nut, either in a slotted piece or applied to the side of the piece of wood.

Q. 309. Is the strap-piece in the Atwood exhibit at the end of the beam slotted, as in the beam of the Rowell's exhibit before you?

A. No; I stated the brace passed up through a mortise.

Q. 310. I know you did, but state it again.

A. Where there is a slot opening out to the end of the beam, as in the Eberly device.

Q. 311. What does the patentee in the Atwood patent referred to claim the adjustable set-screw in the strap-piece at the end of the beam through which the brace passes is for?

A. He claims that it is for the purposes previously described in his specification, to wit, the moving of the plow forward or backward relatively to the beam.

Q. 312. For the purpose of adjusting the plow to run deeper or shallower?

A. For the purpose of adjusting the plow to run deeper or shallower; that is all that he claims in his specifications.

166 Q. 313. Does he not state also that when the plow is so adjusted that the brace is securely fastened by the set-screws in the strap-piece?

A. I think he states that substantially, and means, of course, sufficiently securely fastened to sustain it in position ordinarily.

Q. 314. Is not the device of the plaintiffs marked Plaintiffs' Tooth and Beam more cheaply made than that of the device of the Atwood exhibit?

A. I think that the device of the plaintiffs could be more cheaply made of the same size, and for the same purpose, somewhat, than the Atwood.

Q. 315. Do you not consider the plaintiffs' exhibit marked Plaintiffs' Tooth and Beam a device better adapted for the purposes designed than the device marked Exhibit Atwood Plow?

A. I think the plaintiffs' device is more complete and perfect for the purpose, somewhat, than one could be made upon the Atwood plan, while they are not to that extent to change the principle of either or one with the other.

Q. 316. Are principles patentable?

A. I suppose not, but the application of them is the basis of patents.

Q. 317. Is it not an improvement to place parts in a machine which are better adapted for the objects designed than the old parts were?

A. New adaptations of parts under certain circumstances are, I suppose, the subjects of patentability as perfection patent on older and ruder devices of the same general principle.

Q. 318. Would you not consider the plaintiffs' tooth and the man-

ner of holding it as a device, patentable, when considered in reference to the device marked Atwood Plow?

A. So far as I can see, I would consider it to be a new adaptation of parts entitled to a patent for its special construction, but not of breadth to overshadow others, differing materially from it.

Q. 319. You have critically examined the Haverstick drawings, specifications, and patents, I believe?

A. Yes; I have examined the Haversticke formerly and now.

Q. 320. Is the Haversticke tooth held in position by means of a clamping-bolt in a slotted beam?

A. No; there is not a slotted beam, but it is held in position by a clamping-bolt and spring. The tooth is slotted to receive the beam, instead of the beam being slotted to receive the tooth.

Q. 321. In the Haversticke patent, is the tooth held, I repeat, in a wooden slot by means of a clamping-bolt?

A. No; I think not.

Q. 322. How is the tooth held in position in the Haversticke patent?

A. There are two modes shown in the Haversticke of holding it. The one is by a forceps kind of clamp upon the brace, grasping a corresponding lug or snug upon the tooth, and the other is a
167 single spring located upon a prominence upon the under side of said prominence in front of the tooth, both being held to their work, however, by a clamp-screw.

Q. 323. This device which holds the tooth in position in the Haversticke patent is a spring, is it not, acting on a snug or protuberance on the tooth?

A. Yes; it is a spring in both cases.

Q. 324. About how long is the spring in a working machine of the Haversticke patent?

A. The forceps-like spring would be eight or ten inches long, I should think, and the single spring probably about the same.

Q. 325. And that spring you speak of is compressed against the snug or protuberance on the tooth by means of a set-screw, is it not, in the Haversticke?

A. My recollection is that it is a clamp-screw, which goes through one side and screws into the other, drawing them together, instead of operating as a set-screw through one against the other.

Q. 326. It must operate the set-screw with the single spring?

A. No; I think not. I understand a set-screw to operate from its end, whereas with the single spring it screws through the spring into a nut, or passes through the spring and screws into the nut beyond, thus being a clamping-screw instead of a set-screw.

Q. 327. Then, I understand you, in the Haversticke patent the clamping screw or bolt is used for the purpose of compressing the sides of the spring firmly against the snug or protuberance on the shank of the tooth?

A. Yes; I meant to be so understood.

Q. 328. Then, is not the tooth, when it strikes an obstruction, in the Haversticke patent, and falls back to pass over the obstruction, held by direct force acting against the spring?

A. It is held by direct force, so far as the springs acting are rigid; still, I do not say that it is held by anything but a clamping force.

Q. 329. The clamping force in the Haversticke patent is not applied directly to the tooth itself, by compression of the slots against the tooth, is it?

A. No; not directly to the standard portion of the tooth, but to the forms in front of it to connect with it, however.

Q. 330. Is not the clamping power which you speak of, of holding the springs together, applied to the tooth to hold it by means of passing through the medium of the springs?

A. The clamping force arises from the application of the springs, and is intensified by the enlargement by the escaping portion of the tooth between the springs.

168 Q. 331. Is there not in the Haversticke patent an additional element holding the tooth in position from that of the Rowell exhibit before you?

A. There is a different form of application of resistance, but it would hardly strike me as an additional element.

Q. 332. Is not the spring an additional element in the Haversticke device of holding the teeth over that of the Rowell exhibit marked "Plaintiffs' Tooth and Beam"?

A. I think not. I consider the Rowell device, as used, to be a spring. The wooden jaws certainly retire from the brace of the teeth; when the bolt releases them they are forced down to their natural position on the brace; when the bolt is turned up they clearly operate as a spring.

Q. 333. In the Haversticke device, is not steel used for the spring?

A. I presume so.

Q. 334. What is used in the Rowell device that you term a spring?

A. Wooden jaws are used in the Rowell device; but it is well understood that wood has a good deal of elasticity and spring to it.

Q. 335. Do you consider the construction of the two springs alike?

A. Certainly not. Nevertheless, they operate somewhat alike.

Q. 336. Does not the spring in the Haversticke device operate not only as a spring, but as a direct holding power against the snug or protuberance on the tooth?

A. If by the term "direct" is meant absolute holding power, and I can see no other proper meaning for it, it does not. The cam-like form of the snug in the Haversticke readily escapes from the forceps on account of the large amount of spring that they are provided with from their form and length. I see nothing of a direct or positive power of holding in that device.

Q. 337. Is it not more or less, however, a holding power on the tooth?

A. It has a direct holding power until the force is sufficient to cause it to let go, and such is the fact in the plaintiffs' device. The clamping-bolt in that device draws those two sides into an upright shape, and then to straighten out into a parallel before they let the tooth out, and is drawn clear back of the tooth.

Q. 338. In the Haversticke device, does it; does the spring and

protuberance straighten out in parallel lines before they let go, as in the plaintiffs' device?

A. Not in parallel lines, because they are circular or curved arms in Haversticke; but they straighten out as far apart at their points as the thickest part of the snug over which they have to pass.

Q. 339. If this protuberance on the Haversticke tooth was
169 a right angle instead of a curve, and if the spring fitted into it in a right angle instead of fitting in with a curve, would it then be held by direct power or not?

Counsel for the defendants objects to the question as being too obscure.

A. I suppose it would be in that case, because it would come to a dead stand until something broke.

Q. 340. If the protuberance and spring fitted into each other at an obtuse angle at one hundred and twenty degrees, would there not be some element of a direct power in that case?

A. I hardly think there would be any degree of absolutely direct power in that case, because at that angle, with sufficient force, the forceps would open and let go the snug beyond a doubt.

Q. 341. Is the construction of the plaintiffs' exhibit, marked "Plaintiffs' Tooth and Beam," similar to the construction of the Haversticke device mentioned in his patent referred to?

A. No, not specifically. There is one general resemblance between them; that has hitherto been pointed out.

Q. 342. Is there any resemblance between them, save in certain cases each slips back and passes over obstructions?

A. Yes, there are further resemblances. They both employ a clamping device to hold their teeth to position, and clamping-bolts to control those devices. In this respect they resemble each other broadly in generally.

Q. 343. But are not these clamping devices and clamping-bolts constructed differently in the two devices and applied differently?

A. The clamping-bolt in the forceps device of Haversticke is substantially just such a bolt as the one the plaintiffs' use, and applied in the same relative position to hold the clamps upon the snug and as a bolt in the plaintiffs, to hold a clamp upon the brace. In these respects they only differ in form and material. There is quite an analogy between the two devices in a broad sense, as I before stated, but individually and closely compared the constructions vary.

Q. 344. You mean to be understood that the Rowell device as shown in exhibit, marked "Plaintiffs' Tooth and Beam," is held in position by the same means as it is in the Haversticke device?

A. Yes, so far as being held in position between clamps drawn together by clamping-bolts they are the same. But the form of the clamps and the material of which they are made, as well as the form of the snug in the Haversticke, is different from the form of the brace in the plaintiffs' device.

Q. 345. Then the instrumentalities by which the Rowell tooth is held in position are radically different from the instrumentalities which hold the Haversticke tooth in position, are they not?

170 A. I regard the instrumentalities the same, but the difference is in their forms and application and material.

Q. 346. What is an instrumentality? Does form have everything to do with the instrument, does shape, &c.?

A. An instrument is a tool or device, and form only has a certain amount to do with it, not everything. A jack-knife is a knife, so is a pen-knife, although in form they are more or less different. They are instruments under a generic name or instrumentalities.

Q. 347. Do you consider the plaintiffs' device, to wit, Exhibit Plaintiffs' Tooth and Beam, patentable as compared with the Haversticke device referred to in the patent?

A. I suppose it is patentable, for it has peculiarities on its specific construction, but it has no such breadth of invention in it as it would have if it were the first in the state of the art, embracing those principles and purposes.

Q. 348. Are you an expert in construing patent law as to the broadness of invention?

A. I consider I am more or less in understanding the breadth or limit of character of different inventions. I have had to do with them for a long time, and under circumstances that I could hardly fail to understand this subject tolerably well. I do not claim to be eminent at all, in anything.

Q. 349. Then do I understand you to say that the holding of the Haversticke tooth by means of a spring clasping a snug on the tooth to be similar to the holding of the plaintiffs' tooth by means of a slotted beam and clamping-bolt?

A. I reply as I have before, that they are similar so far as they are devices for the same purpose, and in both cases the standard or its attachments are held by clamps, secured by clamping-bolts. Beyond this the difference in manner of constructing the devices is apparent and has frequently been pointed out.

Q. 350. Has the Haversticke tooth any brace?

A. I do not consider that it has.

Q. 351. Then the Haversticke tooth is held by the clamping-bolt principle directly on the tooth itself, is it?

A. No, not directly on the tooth itself, but upon a flange or appendage of the tooth in front, connected solidly with the tooth.

Q. 352. How far does that protuberance or appendage or snug project from the tooth?

A. I should suppose about three to four inches in a working machine.

Q. 353. Is the plaintiffs' tooth in the device, marked Plaintiffs' Tooth and Beam, held by the clamping-bolt operating on the tooth itself?

171 A. The plaintiffs' device is held by a clamping-bolt operating upon a brace in connection with the tooth, somewhat removed from the pivotal point of the tooth, as in Haversticke.

Q. 354. In your opinion, then, does it make any difference as to the operation of the two devices whether the clamping-bolt operates

directly on the tooth, as in the Haverstick patent, or on the brace, as in the plaintiffs' device?

A. It makes no difference, for the reason that the point of operation in both cases is removed somewhat from the pivotal point of the tooth, thereby securing leverage for holding the tooth in each case. This leverage depends upon how far the clamping portion is from the axle pivot of the tooth.

Q. 355. Then why is there any difference in operation, so far as the clamping power is concerned, between the devices marked Plaintiffs' Tooth and Beam, and that of the defendants' referred to and before you?

A. I do not think there is any difference in the mere matter of operation. One will let go as readily as the other under the same resistance. The difference that I previously pointed out between them was in reference to durability and wear more than to mode of operation.

Q. 356. Will not the device of the plaintiffs, marked "Plaintiffs' Tooth and Beam," last as long, ordinarily, for work in the field, as other portions of the machine for seeding purposes?

Counsel for the defendants object to the question, as the machine of the plaintiffs is not before the witness, in order to examine the workmanship or judge of its durability.

A. I think the tooth or shovel part of a seeder fails sooner than any other portion of it. As a rule, it is exposed to the hardest portion of the wear.

Q. 357. Is that so when used for seeding purposes only?

A. I suppose they are used mainly for seeding purposes, but also somewhat for cultivating purposes.

Q. 358. Is there any such device in the plaintiffs' exhibit marked "Plaintiffs' Tooth and Beam" for holding the tooth in position as is used in the dividers which have been offered in evidence and marked Exhibit Dividers?

A. No; nothing exactly like what is shown in the dividers, but the curved brace in the plaintiffs' device and the clamping-bolt are upon the same principle as the quadrant circle and set-screw of the dividers.

Q. 359. Nothing new about a curved brace, is there?

A. No; curved braces are old, of course; old as the rainbow, probably.

Q. 360. Is the holding of the plaintiffs' tooth, in his device marked Tooth and Beam, held by means of a set-screw, as in the dividers referred to?

172 A. No, not by a set-screw, but by a clamping-bolt, which I hold to be equivalent in mechanics, pretty nearly.

Q. 361. Do you consider a set-screw, for the purpose of holding a seeding tooth in position, like the tooth of the plaintiffs offered in evidence, to be as effective as a clamping-bolt acting on the slotted jaws of a beam?

A. No; clearly not, in that case. It might be used, but would not be as simple or as good.

Q. 362. Has the Fowler & Bacon device, as described in the patent heretofore referred to, any brace?

A. Yes; the standard is braced by a quadrant-shaped supporting iron below it, quite effectual when keyed to its position by the tapering pin.

Q. 363. Does the brace in the Fowler & Bacon patent follow the teeth when falling backward?

A. No; but the tooth follows it in falling backward with more or less resistance, continuous, thus giving the bracing power at all stages of retiring.

Q. 364. In the Fowler & Bacon patent, is not the holding power substantially ended when the tooth is slipped back?

A. I think it is diminished and becomes less, but am inclined to believe that there is some holding power.

Q. 365. The further it falls back the less holding power there is against the tooth, is there not?

A. I am inclined to think so.

Q. 366. In the device of the plaintiffs, marked "Plaintiffs' Tooth and Beam," is not the holding power exerted the same in all positions when a tooth is slipping back?

A. Nearly the same, becoming less as the brace retires from the clamping-bolt. The difference is appreciably small, however. The difference is not great until forced considerably back.

Q. 367. There is a difference, is there not, between the two devices, so far as the holding power is concerned—continuous holding power, I might say?

A. I am inclined to think that it holds all the way around, to wit, that is, the Fowler & Bacon device.

Q. 368. You see the same in the Rowell, do you not?

A. The Rowell also holds all the way around, so far as the tooth would not retire in use.

Q. 369. But do I understand you to hold to your former answer that the Fowler & Bacon tooth, the holding power grows less and less the farther it retires backward?

173 A. My impressions are that the holding power diminishes somewhat in the Fowler & Bacon as it goes back, but continues to a certain degree, to a considerable degree, all the way back, but as the quadrants appear to be circles from their axes.

Q. 370. Is the cultivator tooth and the manner of holding the same, as described in the Fowler & Bacon patent heretofore offered in evidence, similar to that of the plaintiffs' device marked "Plaintiffs' Tooth and Beam?"

A. No, not in detail; they are unsimilar.

Q. 371. In the Fowler & Bacon device is the tooth held by means of a clamping-bolt applied to a solid wooden beam?

A. No, it is not: by a clamping-pin differently applied to iron connections.

Q. 372. Is the clamping power in the Fowler & Bacon device referred to applied by means of a clamping-bolt to the sides of the standard tooth, or is it applied endwise to the shank of the tooth forcing the shoulder of the tooth upwards against a rigid iron plate?

A. It is applied as stated in the question, and not sideways as in the plaintiffs' device.

Q. 373. Do you consider the device described in the Fowler & Bacon patent as simple in construction, or as perfect in its mode of operation, as the device of the plaintiffs' marked "Plaintiffs Tooth and Beam?"

A. I should not.

Q. 374. I understand you to say that the defendants' tooth and beam in evidence is held in position by means of a slotted beam and clamping-bolt similar to that of the plaintiffs' device marked "Plaintiffs' Tooth and Beam?"

A. I do not recollect saying what you state.

Q. 375. Is it so?

A. No.

Q. 376. Do you mean to say you did not state so?

A. I have no recollection of making that specific statement.

Q. 377. What is a clamping-bolt?

A. A clamping-bolt proper is a bolt that draws parts together.

Q. 378. What is a clamp?

A. A clamp, in mechanical parlance, is a tool constituted of two jaws and two screws, one acting as a bolt and the other as a set-screw in principle, such clamps being used for making two joints in many purposes. That is one style of a clamp. There are door clamps of different construction. There are floor clamps for clamping flooring into place, and many articles that take that name different in construction or application, but all calculated to squeeze something.

174 Q. 379. Is the device of the plaintiffs one form of a clamp?

A. Yes. The beam of the plaintiffs is one form of a clamp.

Re-examination:

Q. 380. Suppose that in the defendants' device only one bolt was desired to be used for clamping and the rear bolt be not used for alignment, would, in your opinion, a single clamping-bolt, pivotal-bolt, be practically used for a cultivator tooth, or would, in your opinion, with the exceptions named, it be substantially the same device, if the pivot was properly applied, and you are referred to the exhibits now shown you, marked "Defendants' Beam and T-headed Tooth," and defendants' modified beam having but one bolt?

Counsel for the plaintiffs object to the question, for the reason that it is not proper re-examination; that such testimony should have been produced and offered when the witness was first examined in chief.

A. A tooth thus constructed might be practicable for working purposes for any reason that I can see, but with the one and the one pivot a bolt, it strikes me that it would not be within the scope of the claim.

Q. 381. I do not refer to the patent.

A. Nor substantially the same device, for the reason that the defendants' device has a pivotal and a clamping-bolt, either or both of

which may be used as a clamping-bolt; leaving one of them out makes it practically another construction.

Q. 382. For the purpose of clamping sufficient to hold the tooth in position in operation, is the form of the defendants' shank material? State what is necessary to furnish a proper clamp in practical operation.

A. The form of a shank necessary for clamping properly is one that has breadth and surface forward or back, or about the clamping-bolt, and if it has sufficient of this surface, it could clearly be a clamp practically for business without an additional pivotal point; but with a pivotal point and a clamping surface somewhat removed from it, less of this clamping surface is necessary in order to give the requsite friction or strength. There must be considerable surface or lever-purchase with the surface. Removing the resistance from the center of motion is equivalent to increasing the surface.

Q. 383. Suppose, then, the defendants' tooth, if it were bent upon a straight right angle instead of the curved form shown, would that in your opinion in any way affect the principle of its construction or operation?

A. No; it would not affect its construction or operation as it would have quite as good or a better clamping surface than it now has, provided the bent portion was within the jaws of the beam.

Q. 384. Suppose if, instead of the clamping-bolt, the rear bolt was used for a pivotal bolt and a set-screw properly applied to
175 the bar against the curved portion of the tooth, would it materially affect, in your opinion, the effectiveness or character of the operation of the tooth?

A. I think the tooth would operate equally well, constructed in that way, with a set-screw securely and properly applied.

Recross-examination:

Q. 385. If the defendants' tooth in evidence had no pivotal bolt and was secured in position by a clamping-bolt only with a curved cut-off passing through the solid shank of the tooth, would it operate as perfectly as does the plaintiffs' device or the defendants' device which are in evidence?

A. I see no reason why it would not with the T-shaped head.

Q. 386. I am not speaking of any "T-shaped" head at all. Please confine yourself to the question.

Q. 386. Question repeated.

Counsel for the defendants object to the question on account of its obscurity.

A. I don't think it would with the curve cut off.

Q. 387. Why not?

A. Because it would remove considerable clamping surface.

Q. 388. Would it operate as perfectly in that form as does the defendants' with the pivotal bolt and clamping-bolt and curve?

A. No; I think not.

Q. 389. Why not?

A. For the reason that if the curve was removed it would dimin-

ish the clamping surface, and further, if the pivot was removed, it would decrease the stability of the tooth in the place.

Q. 390. Then, is the model termed defendants' T-shaped tooth as perfect in its operation as is the defendants' exhibit marked Tooth and Beam?

A. I see no reason why the T-shaped tooth has not ample clamping surface as well as pivot, and why it would not operate entirely well practically.

Q. 391. But to so operate it would be necessary to have a more extended surface to the tooth for clamping purposes would it not than in the defendants' device?

A. It might do better to cut the slot further in so as to clamp inside as well as out, which would be only a matter of mechanics.

Q. 392. You do not understand. Would it not be necessary that the tooth should have greater surface in such shape than the defendants' device, in order to have the requisite clamping power exerted against it?

A. It might be necessary to set the tooth a little further forward in the drag-bar, so that the T forms would come within the clamp.

176 Q. 393. Has not the Exhibit marked Defendants' T-shaped Tooth greater clamping surface than the defendants' device offered in evidence, marked Defendants' Tooth and Beam.

A. Yes; I consider that it has.

Q. 394. Is it not necessary for the perfect operation that it should have greater clamping surface than the defendants' device offered in evidence.

A. I consider it would be necessary, if it were not pivoted so that it had the sweep—if not pivoted at one side, I would say.

Q. 395. Do you consider the defendants' T-shaped tooth substantially different in operation from the defendants' exhibit marked Tooth and Beam?

Q. I think it is somewhat different.

Q. 396. In operation is it different?

A. Both in construction and slightly so in operation.

Q. 397. Is not the difference in form one which a mechanic of ordinary skill would readily perceive and make?

A. I should hardly expect a mechanic of ordinary skill to make a device like that with the defendants' patent for its construction.

Q. 398. Could not a mechanic of ordinary skill, with the defendants' device before him, readily make a tooth like the defendants T-shaped tooth?

A. He might do so, but I should not expect it of him.

Q. 399. Would there be any difference in the practical operation of the defendants' device in evidence and that of the defendants' modified tooth?

A. I should not think the modified device would hold as well.

Q. 400. Why not?

A. With the single bolt placed where it is for friction, for the reason that the clamping and pivotal surfaces are close together and

the leverage is not afforded for proper resistance to the same extent that it is in the defendants' device.

Q. 401. Is there not the same objection to the T-shaped tooth, so far as the holding is concerned?

A. The same objection does not hold with equal force against the T-shaped tooth, because it has a limb extending backwards as well forward which receives the force of the clamping-bolt.

Q. 402. In the plaintiffs' device marked plaintiffs' tooth and beam this excessive iron surface is obviated, is it not, by the use of the braces giving greater leverage?

A. There is less friction surface given in the plaintiffs' device than in the T-shaped device of the defendants', but not very much more iron or material in the defendants', for the reason that the
177 brace has about the same material in it that the T-shaped has and such material as the T-shaped construction.

Q. 403. Do not the plaintiffs obtain the same result by means of their brace?

A. Certainly. That is their way of doing it.

Q. 404. If in the defendants' device offered in evidence, marked Defendants' Tooth and Beam, the clamping-bolt was removed, the only power holding it was a pivotal bolt, would, or would it not, be substantially the same tooth held in the same manner?

A. It would be substantially the same tooth, but would not be held in the same manner, nor would it practically hold at all without a clamping-bolt, as I understand it.

Q. 405. In the exhibit marked Defendants' T-shaped Tooth, is there any brace to the tooth, anything operating in the manner of a brace?

A. No, I do not consider there is, a brace being supposed to be the device that supports two continuous parts.

Q. 406. Does not the curved portions of the tooth referred to, so far as holding the tooth in position by means of a clamping-bolt, operate as a brace and for the same purpose, and practically to the same purpose as a brace?

A. They serve the same purposes as a brace as used by the plaintiffs, but I do not consider them a brace. They come nearer being a lever than a brace. A brace ordinarily gives strength to an article as well as resistance. There is no strength imparted in this case by that T-shaped head to the standard.

Q. 407. Would not any form of the head of the shank of the tooth which gave sufficient surface for clamping purposes operate practically, substantially, for the purposes designed?

A. I see no reason why it would not, the object being friction and support.

Q. 408. Would there be any substantial change in the plaintiffs' tooth if it were entirely solid between the shank and brace, in its operation, provided the clamping-bolt passed through the head of it, compressing it in the jaws and beam.

A. The brace and shank might be connected by a web and the clamping-bolt put outside, and still remain the same device, for any reason that I can see.

Q. 409. In the defendants' device marked Defendants' Tooth and Beam, if the pivotal plate was removed as well as the clamping-bolt, and the clamping-bolt placed through the head of the shank of the tooth, how would it operate?

A. It could, by friction, be made to operate with some degree of success; but not the same as it would as shown in the defendants' exhibit.

Q. 410. Do you consider the exhibit marked Defendants'
178 T-shaped Tooth as good a tooth for practical operation as the defendants' exhibit marked Defendants' Tooth and Beam?

A. I see no reason why it would not operate nearly or quite as well; but it would, obviously, be a more expensive tooth to construct.

Q. 411. How would it operate, as compared with the plaintiffs' device marked Plaintiffs' Tooth and Beam?

A. I don't think it would have as good a friction surface, nor has it so good a friction surface as the defendants' tooth and beam. There is more of it, but the friction surface and the pivot are nearer together.

Q. 412. How is the cost of construction of the defendants' T-shaped tooth compared with the plaintiffs' device marked Plaintiffs' Tooth and Beam.

A. I think they would be about alike. Both have a head, and both would contain, apparently, about the same amount of metal.

Q. 413. Do you consider the form of the head of these several teeth of any importance, practically, provided sufficient frictional surface is obtained for holding it properly within the clamping surface of the beam?

A. I don't consider the form of any importance in any other ways than the ease of construction and friction.

Q. 414. If, in the defendants' device marked "Defendants' Tooth and Beam," the pivotal bolt was removed, and the clamping-bolt, instead of being in front of the tooth, passed through the head of the shank of the tooth, and used for a clamping-bolt with a set-screw placed against the curved portion of the tooth in the place of the pivotal bolt, would it be the same tooth under the defendants' patent, and would it operate equally as well as the defendants' device referred to?

A. It would not be the same tooth identically, but if properly constructed, as stated, I think it would work well practically.

Q. 415. Would it be as good a tooth to make it in that form and operate as well, and be as cheap and satisfactory, as that of the plaintiffs' device?

A. Yes, I think it would be as well and as easily made; and, for all I can see, it would operate equally as well, for a set-screw, with its necessary iron nut properly secured, could be applied quite as cheaply as the brace of the plaintiffs', even adding the extra expense of curving the top of the standard of the defendants'; I think the supposed construction, as a whole, could be quite as cheap as the present construction of the plaintiffs', and, while I would not deem it

as snug and neat a construction, I see no reason why it would not operate well enough in use.

Q. 416. Would not a set-screw operating from a wooden jaw against a curved form of brace operate practically well?

A. It would have to have a cam-like nut through which to pass, and that nut would have to be secured by extensions each side of and through the drag-bar with bolts or screws.

179 Q. 417. And you think all this work would be as cheap as to make the plaintiffs' device?

A. About the same, for the reasons that the head of the brace upon the plaintiffs' tooth must be two or three, and perhaps four times, as much expense as curving the top of defendants' tooth, and this saving would, clearly, supply the screw nuts spoken of.

(Signatures waived.)

Plaintiffs' counsel asks that all the answers of the witness not responsive to the questions be stricken out.

The further taking of this deposition was adjourned until Wednesday, September 10, 1879, at 9 o'clock.

The further taking of this deposition was resumed on Wednesday morning, September 10, at 9 o'clock.

J. S. BOGLE, being first duly cautioned and sworn, testifies as follows:

Direct-examination:

Q. 1. What is your name, age, residence, and occupation?

A. John S. Bogle; forty-three; Springfield, Clarke county, Ohio; not in business at present; have been employed for the last twelve years in the agricultural implement business.

Q. 2. How long since you have been out of business, and with what firm were you engaged?

A. I have been out of business about four or five months. Prior to that I was connected with the company of Thomas, Ludlow & Rogers, Springfield, Ohio, having been with them since their organization as a stock company.

Q. 3. How long have you been engaged in that line of business with that company or their predecessors?

A. Since 1868.

Q. 4. State what experience you have had, if any, with regard to the building and selling of the seeder manufactured by them known as the "Superior Seeder"?

A. During my connection with that company and its predecessors I occupied the position of general agent and had the general supervision of the sales of their implements, including the Superior Seeder mentioned.

Q. 5. Who introduced that seeder into the market?

A. I introduced it.

Q. 6. How many years were you in charge of the selling of the seeder?

A. From the time of the manufacture, which was in 1872, until the time that I dissolved my connection with the company.

Q. 7. In what territory?

180 A. In Wisconsin, Minnesota, Iowa, in fact all the territory in which broadcast seeders are used.

Q. 8. During this period of time, mention some of the prominent seeders with which you have become acquainted in the market?

Counsel for plaintiffs objects to the further testimony of this witness, for the reason that we have not been referred to his name in the answer of the defendant, or any notice given us respecting the taking of his testimony.

Counsel for defendants responds that he has not been notified of the names of any of the witnesses that they have intended to use in their bill.

A. I am somewhat acquainted with the Buckeye, McSherry, the Rowell, Van Brunt, the Gorham, the Esterly, and several others.

Q. 9. Who builds the Buckeye?

A. It is built by P. P. Mast & Co., Springfield, Ohio.

Q. 10. How long has it been built by P. P. Mast & Co., of Springfield, Ohio, if you know?

A. I cannot give the exact date of its being built in its present form. I think since 1872, but I am not positive as regards these dates.

Q. 11. Look at the Exhibit Mast, and state whether or not that represents the seeder sold by that company since about 1872?

A. According to my best recollection, it is substantially the same.

Q. 12. State whether or not that would be considered in the market and among mechanics making and selling them as braced tooth?

A. I should not think, sir.

Q. 13. What complaints, if any, were ever made to your company in regard to the operation of the seeding machines having a device like the defendants' tooth and beam?

A. If the question means to refer properly to the construction of the tooth and beam, my answer would be: The only complaint has been that the shank would sometimes bend. In fact, our first machines suffered considerably from that cause, necessitating the use of heavier iron in the shank.

Q. 14. Look at that exhibit and state whether or not you can tell whether or not it has been used, whether it has the appearance of being used practically.

A. Yes, it has the appearance of having been used considerably.

Q. 15. Examine the shank of the tooth, and state whether or not you find it bent.

A. Yes, I find it slightly bent backwards, appearing as though it had been done by meeting an obstruction in the ground, bending the tooth before it yielded at the clamping-point.

181 Q. 16. Will or will not iron of that kind, once started to bend, continue to bend with a less amount of strain than required to start the bending?

A. Yes; after having changed the fibre of the iron by bending, it would lose its stiffness to a considerable degree.

Q. 17. Please compare the practical workings of the defendants' tooth and beam with the plaintiffs' tooth and beam. State how they agree in their practical workings regardless of structure.

A. As I understand it, the two devices are intended to perform identically the same work, and the difference in their practical working is not necessarily different so far as I can see, although different in construction.

Q. 18. What difference is there in construction. Mention the most prominent one.

A. The difference is obvious to a mechanic. The prominent feature of difference, of course, is that the plaintiffs' device is provided with a curved brace connected with a shank about middle way, the rear part of the shank extending backward into the bar, which serves as a support to the shank, strengthening it, and also holding it in position for work by means of a clamping-bolt.

Q. 19. Please compare the two devices as regards the brace, and state how they agree or differ.

A. I do not consider that the defendants' device is provided with a brace at all, in any sense of the word, so far as the supporting of the shank is concerned; or, in fact, in any sense of a brace, as applied to the shank of seeder teeth.

Q. 20. Which of the two devices — be made to practically perform the operation of a cultivator tooth in seeding machines with the least amount of metal, that is to resist all the strain which is ordinarily brought to bear upon them?

A. I don't see that there would be very much difference in the weight of the metal used. I should think, however, that with the plaintiffs' construction a little lighter iron might be used with safety, owing to the fact that the brace performs the office of giving strength to the shank, while in the defendants' device, not having a brace, requires the use of heavier iron.

Q. 21. Would the bending which you find in the defendants' exhibit marked Tooth and Beam, be likely to occur in the plaintiffs' tooth?

A. I think not, sir.

Q. 22. What difference, if any, do you find between the defendants' tooth and beam and other devices, if you know of any, not using a brace, so far as the clamping is concerned, and you may refer to such as you have knowledge of?

A. I see but little difference in the practical working of the defendants' device and the Buckeye and the Esterly, and several others that I might mention, the principal difference being the degree of friction obtained by the different constructions, the result in each case being the same, so far as I can see, other than the degree of friction.

182

Q. 23. What would be the result of pivoting the defendants' tooth at the curved portion of the shank and omitting the forward bolt as shown in the defendants' exhibit, Modified Tooth and Beam?

Counsel for the plaintiffs object to the question, for the reason that this witness has not been shown to be an expert.

Q. 24. You may first state, before answering the question, what your mechanical experience is, if any.

A. I have had some mechanical experience in the construction of these machines.

Q. 25. What has been your general mechanical experience; of what nature; how long have you been engaged in the shop?

A. I have been connected with the manufacture of such machines for the last twelve years, and have given more or less attention to the mechanical construction, mechanical action, of the different devices used.

Q. 26. You have superintended the construction of getting up different kinds of agricultural implements?

A. I have.

Q. 27. For how long has this been your custom?

A. I have given it considerable attention for the last two or three years particularly, although during my entire connection with the company I have suggested such changes to a considerable extent.

Q. 28. Did you ever work with tools; if so, what?

A. I have never occupied the position of a practical mechanic in the shop myself, but I have occupied the position of suggesting the means and methods of constructing our different devices.

Q. 29. Whose business, in your company, was it to find out what defects existed in such machines and how to remedy them?

A. I presume all the members of the company were interested in discovering such defects. It was generally my business, however, to give personal attention to these matters in the field and report my experience in the matter with my suggestions for the remedies.

Q. 30. What other member of the company did you principally — with in regard to these things?

A. I consulted more particularly with Mr. Ludlow, generally, although with all the members of the company.

Plaintiffs' counsel asks that all the foregoing testimony of this witness in the nature of expert testimony be stricken out, for the reason that it has been clearly shown that the witness is not an expert in this matter.

Q. 31. What would be the result of pivoting the defend-
183 ants' tooth at the curved portion of the shank and omitting the forward bolt as shown in the defendants' Modified Tooth and Beam?

A. The result would be the lessening, to some extent, of the effect of the clamping-bolt; but so far as the practical working of the device might be, aside from the convenience of the alignment of the tooth, there would be but little, if any, difference, except, as I first said, in the degree of tension.

Q. 32. Would it not, in your opinion, practically operate in that manner and stand the ordinary resistance of tilling?

A. If properly constructed, I think it would. There, however, is one feature that I omitted in my former answer that I would like to supply now; with the clamping-bolt used as it now is in this exhibit as a pivotal bolt, it might require a strengthening iron at the point that that plate perforates the shank. In fact the perforation would render the shank less able to stand the meeting of obstructions. It would weaken it. It would, therefore, necessitate the strengthening of the shank at that point to render it equally effective, as it otherwise would.

Q. 33. Suppose you pivot the tooth in the curved portion of the shank and curve the iron backward properly within the slot, extending backward and downward in the rear of the clamping-bolt, the shank and tooth being properly constructed, what would be the practical difference in operation?

A. If the shank and tooth were constructed as the question indicates, in my opinion, there would be no practical difference in its working operations, except, as before stated, the convenience of alignment and the degree of the rigidness of the clamp. That, however, I do not consider of any practical importance, the construction described affording sufficient clamping surface to hold the tooth for all practical purposes.

Q. 34. What practical utility, then, has the forward or curved portion of the defendants' T-headed tooth, if any?

A. I consider the forward limb of the T of very little, if any, practical value.

Q. 35. State whether or not it is necessary in the operation of the defendants' tooth and beam to use the two bolts, and why they are used?

A. As a matter of necessity the two bolts are not required. As a matter of convenience in the alignment of the tooth and to increase the effect of the clamping-bolt the two bolts are used, although, as before stated, they are not absolutely necessary for the practical working of the device.

Q. 36. What would be the result, practically, if, instead of using two bolts, the teeth were pivoted in the curved portion of the shank and a set-screw was properly applied to have the end of it bear continuously upon the curved portion as a frictional clamp?

A. If the pivotal bolt be used as it now is in the forward
184 part of the curve, the friction bolt dispensed with and a set-screw properly applied and adjusted, the practical result would be the same as it now is.

Q. 37. What would be the comparative cost of construction of the two devices?

A. There are numerous ways by which this end might be reached; but, of necessity, the construction need not be increased from its present expense. The set-screw and its application can be provided and used with no greater expense than the present mode of clamping the tooth, in my opinion.

Q. 38. Your attention is now called to the device now shown you, marked Rowell Tooth and Beam, No. 2. State whether or not, in your opinion, that has been used practically.

A. I should think it had been used but very little, if any.

Q. 39. What will be the comparative cost of that tooth as compared with the defendants' tooth and beam?

A. In point of material there would be very little difference; in point of construction the defendants' device, I should think, would be considered the cheaper. From the form and appearance of the brace used in the plaintiffs' device it is evident a former must be used for the purpose of giving it a uniform curve, and the time occupied to handle that piece would perhaps be the same as for giving the curve to the defendants' shank; and in that respect the labor would be about the same. In the plaintiffs' device this curved brace is united with the shank by means of welding, which process would require a considerable amount of labor not employed upon the defendants' device. Estimating that expense from such knowledge as I have of that work, I should say that the cost of construction of defendants' device would be from 1¾ cents to 2½ cents per tooth cheaper than the plaintiffs'.

Q. 40. Are you pecuniarily interested in the event of this suit?

A. None whatever.

Q. 41. Please look at the device marked Atwood plow, and state how it agrees with or differs from, in your opinion, in its principles of construction and mode of operation from that of the exhibit plaintiffs' tooth and beam?

A. So far as the principles involved in the construction of the two devices are concerned and the practical working I see but little, if any, difference. I find in the Atwood device, instead of a curved brace, a straight brace, operating on a pivot at its point of connection with the standard or shank, which gives it all the advantages that can be claimed for a curved brace attached rigidly, for the reason that it adapts itself to the movement of the beam. Instead, however, of the bifurcated or forked bar, as shown in the plaintiffs' device, I find a slotted bar or bar with a mortise through which this straight brace passes and a set-screw for the purpose of retaining the brace in any desired position. The office of that set-screw I find to be precisely the same that the clamping bolt is in the
185 plaintiffs' device—perform the same function. Consequently I see no practical difference in the construction of the two devices when applied to the same uses.

Q. 42. Which, in your opinion, would make the most durable clamp, the bifurcated wooden bar and clamping bolt, or the metallic clamp, such as is shown in the Atwood device, or the Gorham, or the Esterly?

A. In point of wear, I should think the exhibits referred to, namely, the Gorham, and Atwood, and Esterly, would be preferable.

Q. 43. State how many inventions, if any, you have made during your connection with this company, upon which you have obtained patents for improvements upon seeding devices.

A. I don't know that I can state the number. I have made a good many; have obtained seven or eight patents. I cannot state the exact number from memory.

Q. 44. State whether or not these improvements, generally, have been incorporated into the machines built by your company?

A. Yes, I believe they have, the most of them.

Cross-examination:

Q. 45. I understand you have stated in your direct examination that your business in this company has been that of a traveling or general agent introducing machines, did I?

A. I stated that it had been my business to superintend the external affairs of the concern, so far as the selling and introduction of the machinery was concerned, but I do not wish to be understood as stating that I had no other office or interest in the company than simply than the introduction and selling of the machines.

Q. 46. Is this company you speak of a joint stock company?

A. It has been a joint stock company from, I think, 1872; prior to that time it was not a joint stock company.

Q. 47. Were you a member of the company or an employé?

A. From its organization as a joint stock company to the time that I disconnected myself from the company, I was a member of the company. Prior to that time I was an employé.

Q. 48. Are you an inventor.

A. Yes, I suppose I am to some extent.

Q. 49. What have you invented?

A. I have invented a number of improvements on seeding machines.

Q. 50. Have you invented anything in reference to seeding machines connected with the tooth or the manner of holding it?

A. I have not taken out any patents on any of those devices, but I have tried a great many experiments as to the practical
186 working of the different constructions, and, in that respect, I may be said to have made some inventions.

Q. 51. Do you consider yourself thoroughly familiar with the several devices that have been shown you in connection with your testimony here to-day?

A. I do not know what degree of thoroughness counsel for plaintiffs may deem essential, but I consider myself conversant with the practical working of these devices sufficiently to be able to form an intelligent opinion as to whether or not they will operate as designed.

Q. 52. Are you familiar with the different devices and the names of such devices used in mechanics?

A. No, sir; not all of them.

Q. 53. What do you understand invention to be?

A. I understand invention to be embodying a new idea in a practical form whereby it may be reduced to usefulness.

Q. 54. Would it be invention to embody an old idea in a new and practical form?

A. If I understand the question, I am not prepared to say that the embodiment of an old idea in a new form would be invention, unless it performs a new function. Then it might be an invention.

Q. 55. Then you would not consider an old idea embodied in a

new form an invention, unless it performed a new function, would you?

A. The old idea, of itself, would certainly not be an invention. It must necessarily be combined with some new ideas, and the circumstances under which these combinations might be made are so varied that it would be difficult to state, in absolute terms, whether it would or would not be an invention.

Q. 56. Do you, then, consider that to constitute invention there must be some new idea involved?

A. I think so, sir.

Q. 57. What do you understand by the term brace?

A. My general understanding of the term brace is a connection between two or more parts, whereby the parts are strengthened or rendered firm in that connection.

Q. 58. Then you do not consider it necessary that a brace should be firmly joined to another thing, if it only is so joined to it as to afford the support which a brace requires?

A. That depends on the office the brace has to perform. In some cases it need not be rigidly connected; in others, it must be, by virtue of its office.

Q. 59. Look at the exhibit, marked Mast Drag-Bar, which you find referred to in your direct examination. Of what is that device composed?

A. So far as I can see, it is composed of wood, iron, and steel.

187 Q. 60. How are they made and how connected?

A. The head, what I would term the head of the shank, head of the plate, or clamping surface of the device, is made of cast-iron, provided with a wrought-iron stud which appears to have been set in sand. The shank is made of wrought-iron with two perforations in it and a forged point or shovel, I think made of steel, welded on to the shank. The shank, although now broken, appears to have been riveted on this wrought-iron stud set in the cast-iron, and, I think, from its present appearance is designed to be rigid. The shank and head are clamped in a slotted bar by means of a bolt which passes through the bar and through the lower perforation in the shank, and is held in any desired position by means of friction. The head is also provided with perforations for brick pins whereby it may be held in position without the use of a clamping-bolt as a clamping-bolt.

Q. 61. How far does this head-plate you speak of come down?

A. Below the point where the tooth is attached to the slotted beam by means of the clamping-bolt. From the center of the pivotal point to the lower extremity of the disc is two and one-half inches.

Q. 62. When the tooth and head-plate is in position in the slotted beam, when the slotted beam is compressed against the head-plate, does it bind against the shank of the tooth?

A. Yes, I think it would.

Q. 63. At what point and to what degree.

A. I think it would bind more or less to the entire width of the clamping-bar. The degree, of course, would depend altogether upon

the tension put upon the clamping-bar. If you are to presume that the clamping-bolt will not spring or yield to pressure, the friction on the shank alone would not be very great, but inasmuch as the bar must yield and is designed to do so, therefore the friction will depend upon the tension of the clamping-bolt, as before stated.

Q. 64. Were a straight-edge placed across the face of the head-plate and shank of the tooth, would it strike the shank of the tooth; and, if so, where?

A. In the device before me a straight-edge strikes the shank at the lower perforation.

Q. 65. The lower perforation you speak of is where the pivotal bolt passes through, is it not?

A. Yes.

Q. 66. Would the jaws strike the hole through which the pivotal bolt passes?

A. I did not say that it strikes the hole, sir; I said that it struck at the perforation; I did not say the perforation.

Q. 67. Could the jaws of the beam strike at the perforation when the pivotal bolt was in position and the tooth in working in order?

188 A. Presuming that the perforation in the slotted bar fits the bolt, the bar would certainly strike the shank at the point surrounding the bolt where it was as high or higher than the flanges of the head or disc.

Counsel shows the witness the slotted bar accompanying the tooth referred to.

Q. 68. In this bar has the tooth been worked backwards and forwards with the head-plate?

A. It does not look as if it ever had been in practical use.

Q. 69. Has not this tooth and head-plate been worked backwards and forwards with the clamping-bolt in position in the slotted beam just shown you?

A. Possibly they have, but to what extent I could not state, or what amount of tension was applied to the bolt.

Q. 70. Will you please put the tooth and head-plate in position in the slotted beam ready for work, clamped sufficiently for ordinary use in the field, and work the same backward and forward, and by actual experiment determine if the slotted jaws in the beam are pressed against the shank of the tooth and determine by the marks on the jaws of the slot and give us the result of the experiment?

A. Upon placing the device in working position and operating it as I understand the question, I find the jaws of the beam press to some extent against the shank of the tooth at the lower and upper sides of the bar, not sufficiently, however, to hold it in working position independent of the clamping surface of the head. Nevertheless it clamps the shank perceptibly, and as stated in a prior answer the degree of friction upon the shank will depend altogether upon the amount of tension put upon the bolt.

Q. 71. With the position of the head-plate and tooth in the slotted beam as just before described, when the tooth strikes an obstruction

and presses backward, what does the shank of the tooth first strike against in this device; does it not strike against the protuberance on the head-plate?

A. In this broken device it certainly does, but were the device not broken I am unable to state, not knowing the exact relation of the shank and its head when made as designed for use.

I infer from appearances the shank and the head are designed when attached to the clamping-bar by means of the clamping and pivotal bolt, to be rigid in their connection and interchangeable in their relation to each other.

Q. 72. Is not the head-plate held more rigidly between the jaws of the beam than is the shank of the tooth?

A. Yes, it is.

Q. 73. Then will you explain to me how, when the clamping-bolt is used and the tooth in position in working order for the field, that the tooth and head-plate will move together backward when striking an obstruction?

189 A. By rotating upon the pivotal bolt. That is my answer.

Q. 74. Is the attachment of the tooth to the head-plate of so firm a character as to keep the tooth in position, in working order, without breakage?

A. That depends upon the kind of work it has to do.

Q. 75. This is ordinary work, ordinary working order?

A. It is liable to breakage from accident, as all other devices are; but I see no reason why it should not work under ordinary circumstances without breakage.

Q. 76. The clamping pressure of this device being chiefly upon the head-plate, would not the strain against the tooth, when meeting an obstruction, first come almost entirely upon the tooth itself and its connection with the head-plate, and not directly upon the head-plate itself?

A. If the head-plate be firmly and rigidly connected with the tooth, it would be simultaneous.

Q. 77. Does not the lower portion of the head-plate in this device operate as a brace of the tooth to some extent?

A. I cannot say that it does, even in this broken device.

Q. 78. Have you not, in performing the experiments just mentioned, clamped the device more rigidly than it is in actual work?

A. Doubtless it would work in some kinds of soil and some circumstances less rigidly clamped.

Q. 79. If it was less rigidly clamped, then would not the head-plate act as a brace to the tooth?

A. I find in this device that the shank of the tooth will not touch the flange of the head-plate on the lower side of the bar under the conditions named by counsel for the plaintiffs.

Q. 80. In the device under consideration, does not the head-plate act as a brace for the tooth in working condition?

A. It does not, in my estimation, act in any sense as a brace to the shank of the tooth. It performs the office of holding the tooth in any desired position for work, but does not in any ways strengthen

or support the shank in the performance of that work, so far as I can see.

Q. 81. Does it not support the tooth in position?

A. As before stated, it certainly keeps the tooth in required position for work; but I cannot see that it in any ways strengthens or braces that tooth in the nature of a brace. Any object fixed in a given position may be said to be supported in that position; but it may not necessarily be braced in that position, by what I understand as a brace.

Q. 82. May not the brace be placed in any position in reference to the object braced, either above or below it, or on the side, or laterally?

A. Braces may be applied in different ways, but I should think in all cases, if they serve as braces, they must perform the
190 functions of a brace in strengthening the part to which they are attached, between the point at which the resistance is applied and the pivotal point or fulcrum.

Q. 83. Look at the device marked Exhibit "Plaintiffs' Tooth and Beam" and the device marked "Defendants' Tooth and Beam." Do not both these devices have a slotted beam holding the tooth in position, constructed in the same manner?

A. So far as the beam is concerned, they are similar in construction.

Q. 84. Are not both teeth in the devices named held by a pivotal bolt?

A. I do not understand that in either device they are held in position by the pivotal bolt, independent of the frictional bolt.

Q. 85. Each have a pivotal bolt, do they not?

A. They do.

Q. 86. And each have a clamping-bolt, do they not?

A. Each has a clamping-bolt.

Q. 87. Does or does not the defendants' device referred to have any clamping power by means of the pivotal bolt passing through the tooth?

A. It has some. The degree of power depends somewhat upon the length of the slot and the amount of tension on the bolt.

Q. 88. Then you consider, do you, that the pivotal bolt in the defendants' device exercises some power in holding the tooth in position?

A. It would depend somewhat upon circumstances. It, of itself, as the tooth is constructed, would not be sufficient, located as it is, to hold the tooth in position firmly for all uses without the use of the clamping-bolt, or its equivalent.

Q. 89. But, with the use of the clamping-bolt, do you consider the pivotal bolt exercises some power on the tooth in defendants' device?

A. That depends, sir, very much on circumstances. As before stated, it may or may not, owing to the length of the bifurcation, the thickness of that portion of the shank through which the pivotal bolt passes, and the tension applied to that bolt.

Q. 90. In the defendants' device before you, marked Exhibit De-

fendants' Tooth and Beam, with the tooth in working order, does the pivotal bolt exercise any clamping power upon the tooth?

A. Yes; it does to some extent.

Q. 91. Then, from your definition of a brace, which you have just given, does not the curve of this tooth operate in some degree as a brace to the tooth in the defendants' device?

A. I cannot see how it acts as a brace to the tooth, as before stated, in the sense of a brace. It increases, to some extent, the friction—I might say to a considerable extent—the friction upon the tooth, in passing backward and upward through the slotted bar,
191 from the fact that it requires the tooth to pass somewhat laterally through the bar rather than a simple rotating on the pivot. Therefore, it will require a greater resistance to move the tooth with the same amount of force applied to the frictional bolt than it would if the pivotal bolt were dispensed with. But so far as acting as a brace to the shank is concerned, I cannot see that it does, for this reason, if for no other, that when force be applied to the point of the shank, the relation of the shank and bar at the clamping point must, necessarily, be changed before the pivotal bolt can be brought into requisition, so far as strengthening the shank is concerned, and at that point when the tooth has once started, there is no brace required to keep it in position further. Hence, I cannot see that the curve of the shank, with the pivotal bolt in the forward end, as shown in the defendants' device, can, in any sense, act as a brace for sustaining the shank by way of strengthening it; but, on the contrary, the simple fact that it adds to the friction but does not give any sustaining force to the shank below the bar or point where it is clamped, it rather has the reverse effect, that is to say, the shank is more liable to bend than it would be were the pivotal bolt dispensed with.

Q. 92. Do you still maintain that the pivotal bolt acts as a clamp in force against a tooth in working order when passing over an obstruction in the defendants' device?

A. Yes; it does to some extent.

Counsel asks the notary to read the witness' definition of a brace for the recollection of the witness. Answer read.

Q. 93. Does not the curve of the defendants' tooth operate as a brace, it being between the point of resistance at the point of the tooth when the tooth passes over an obstruction and the place where it is attached, to wit, the pivotal point, according to your definition of a brace just read to you?

A. Taking a shank as shown in the form and considering the pivotal bolt the fulcrum, as I understand counsel to refer to it, then, as constructed, the shank has no brace whatever between the point and fulcrum, except the brace that is furnished by the clamping-bar at a point between these two points; other than the bar, and that clamp upon the bar, there is no brace whatever.

Q. 94. You have said that the bending of the defendants' tooth was more likely to occur than that of the plaintiffs', have you not?

A. Yes; I think I have said so.

Q. 95. Do you mean to be understood that the plaintiffs' tooth will not bend under any circumstances when meeting obstructions?

A. No, sir; I do not mean to be understood that it is impossible to bend the shank, for, if the brace be secured sufficiently by the clamping-bolt to hold it against a necessary force, the shank might be bent at a point below where the brace is connected, but it
192 could not be readily bent above that connection. In ordinary use I should think the plaintiffs' device, as constructed would not be liable to bend.

Q. 96. Do you consider the construction of the defendants' tooth and that of the Mast tooth similar?

A. The construction is somewhat different, but the result attained is the same, except in the degree of rigidness. There may be some difference in the degree of rigidness.

Q. 97. Is the working of the two devices, to wit, the Mast referred to and the defendants' referred to, to obtain the same result, the same?

A. I do not know that I exactly understand what counsel means by "is the working the same to obtain the same result." I do not know exactly what I am to understand by that word "working."

Q. 98. Then I will have the notary insert "working or operation."

A. So far as producing like results is concerned, the working must, necessarily, be similar, the result being that of the proper cultivation of the soil.

Q. 99. Are you sure?

A. Yes.

Q. 100. Do you claim that because two machines produce like results their manner of operation to produce such results are alike?

A. They may not necessarily be constructed alike, but I think there must be a similarity of operation to give the same result, so far as the result itself is concerned. In one sense of the word they may operate in a different manner to some extent.

Q. 101. Do you consider the two devices shown you, to wit, the Mast and the defendants', work in a different manner to produce like results, and, if so, explain such working in each device?

A. I would like to have counsel for the plaintiffs explain more fully what he proposes to cover by the term work. The word "work" will apply to the operation of the whole of the devices regardless of any construction whatever, and if he will please state what he wants referred to particularly by the word "work," I will try and answer the question as well as I can.

Q. 102. Explanation given.

A. I have already attempted to describe, according to the best of my ability, the manner in which each of these devices operates, and have also spoken of their individual construction, and, as before stated, although different somewhat in construction, they produce similar results.

Q. 103. How do they operate to produce similar results? Explain fully.

A. The function of the tooth in each device is the cultivation of the soil; that the tooth is so constructed as to adapt itself to readily yield

when brought in contact with immovable obstructions, and
193 they are both designed to give the similar result, namely, to yield, when such obstruction is met. One of the devices is held in position by a single bolt which acts as a clamping bolt and a pivotal bolt. Its office, in connection with its peculiarly constructed shank and head, is to hold the tooth in the required position for work and yield for necessary obstructions. In the defendants' device, they have two bolts instead of one to perform the same office. Hence, in the result obtained in practical working, I see little, if any, difference.

Q. 104. Is this as near as you can answer the foregoing question?

A. As I understand the question in its general terms, I have no different answer, to the best of my ability.

Counsel shows the witness the device referred to as the Esterly device, marked "Exhibit Esterly Drag-Bar."

Q. 105. Is this Esterly device constructed similar to that of the defendants?

A. There is some difference in the construction.

Q. 106. Has it a slotted wooden beam for holding the tooth in position similar to that of the plaintiffs' and defendants'?

A. It has a mortised beam, not a forked or bifurcated beam.

Q. 107. Has this device a tooth held in position by means of a clamping-bolt?

A. Yes, it has.

Q. 108. Is the mode of operation of this tooth, to wit, the Esterly, similar to that of the plaintiffs' and that of the defendants'?

A. It differs somewhat in construction from both of the devices referred to. As before stated it does not have a forked bar, nor does it have the curved brace found in the plaintiffs' device, and with reference to the defendants' device, it differs in this respect; the shank of the tooth is pivoted at a point between the friction bolt and its working point or shovel, and it is clamped upon a metallic surface instead of by the wooden bar.

Q. 109. Have you not heretofore stated that the difference between the several devices, to wit, the defendants', the Esterly, the Atwood, and the Buckeye, was merely the degree of friction exerted by the clamps on the several teeth?

A. I did not say, and do not wish to be understood as saying, that the construction of the several devices was the same, but I meant to be understood as saying that, with their several constructions, they gave a like result except in the degree of friction, and so far as braces supporting the shank of the tooth at a point below the bar is concerned, I think they are alike. In the former answer referred to by counsel for plaintiffs, when speaking with reference to the different kinds of the different devices, so far as the degree of friction
was concerned, the Atwood device is not referred to, or at
194 least, not intended to be referred to. If mentioned, it was by mistake, as the Atwood has clearly the sustaining brace not found in any of the other devices named.

Q. 110. You have stated in your direct examination that, if in the

defendants' device the clamping-bolt was removed and a pivotal-bolt put through the curved head of the tooth, the practical working of it would differ but little from the device of the defendants' itself, did you not?

A. I think I stated if so arranged and properly constructed, the practical working of the device would not be seriously changed or affected.

Q. 111. What do you mean by the term "properly constructed" in that reference?

A. I mean to construct with reference to its use in that form.

Q. 112. How would you construct it with reference to that use in that form?

A. I would simply reverse the curve on the tooth, place the pivotal-bolt at a point somewhat further forward in the slotted bar than it now is, and perforate the shank at a point in line, or nearly so, with the center of the lower extension of the shank, and would somewhat increase the strength of the iron at the point of perforation.

Q. 113. Would such device as you have just described, be like the device referred to, marked Defendants' Modified Tooth and Beam?

A. There would be no essential difference in the form or amount of metal used, except adding strength to the tooth at the point of perforation. The only difference would be in reversing the tooth in its position in the bar and changing, somewhat, the location of the pivotal-bolt.

Q. 114. What would be the object of reversing the curve on the tooth in the exhibit referred to?

A. In order that the clamping-bolt would have the greater effect on the tooth, inasmuch as the slotted-bar would be brought together at the points, thus clamping the tooth more firmly.

Q. 115. Do you mean to be understood that there is but little or no clamping force exerted on the curve of the tooth when it is in front of the shank with the clamping-bolt in front of the position in which it is in the exhibit marked Defendants' Modified Tooth?

A. There is some force, but not as much as there would be were the tooth reversed, and, as stated in a former answer, the degree would depend somewhat on the length of the slot.

Q. 116. Why would you place the pivoted-bolt farther forward?

A. Because with a tooth formed just as it is now and reversed in its position, the curved portion of the shank would come outside of the clamping-bar.

Q. 117. Could not all this be as well done by simply enlarging the head of the tooth where it is clamped in the slot in the bar having a head-plate, in other words, forming a portion of the shank of the tooth sufficiently large to get the requisite friction?

195 A. If the question means to refer simply to the means of holding the tooth in position, I answer I think it would be in the case you speak of where you would change the position of the curve of the tooth backward instead of forward on the tooth.

Q. 118. Would, or would not, the curve in that form operate to some extent as a brace to the shank of the tooth?

A. Under the construction assumed, it would not, in any sense, act as a brace, so far as strengthening the shank is concerned.

Q. 119. You would consider, however, would you, the tooth modified in such manner similar in all respects to that of the defendants?

A. No; not in all respects, for, under the assumed construction, we would have but one bolt, and that bolt both a pivotal and a clamping bolt. In the other construction we would have the two bolts—the clamping bolt and the pivotal bolt—the clamping bolt serving a purpose in additional to that of the clamping bolt, namely, that as a means of alignment. That we would not have under your construction; but, for practical work, aside from that of alignment, they would give a like result, except, perhaps, a difference in the degree of clamping power.

Q. 120. In the exhibit marked Defendants' T-shaped Tooth, is not the forward curve valuable for the purpose of retaining an increased friction pressure by means of the clamping bolt?

A. Yes; it probably adds somewhat to it, as constructed, but I think the assumed construction, namely, the single limb curved backward, would be equally as rigid.

Q. 121. In effect, is such tooth anything more than an enlargement of the shank for frictional purposes?

A. No, sir; I think not.

Q. 122. Then, do you consider it is unnecessary for the defendants to use the two bolts that they have in their device?

A. So far as the convenience of alignment is concerned, it is necessary for them to employ two bolts, as shown in their construction. So far as the working qualities of the tooth is concerned, and so far as any bracing character of the curve or extension of the shank is concerned, I do not consider that it is necessary at all for them to use the two bolts.

Q. 123. Then, in your opinion, the defendants' device, marked Defendants' Tooth and Beam, would be just as effective by the removing of the clamping bolt?

A. No, sir; not by simply removing the clamping bolt and leaving it with the one pivotal bolt, as it then would be, but, under the assumed construction named, that of changing the pivotal bolt and reserving and reversing the curve in the shank, under such construction I think it would be equally effective for all purposes.

Q. 124. Then, in the defendants' device, marked Defend-
196 ants' Tooth and Beam, is it necessary, in your opinion, that the device should be constructed as it is before you, in order to operate for the purposes designed?

A. If the design be to continue the purposes of alignment, it is necessary to have that construction, or some other that would provide that convenience, but, with reference to the particular work of retaining the shank in position, I do not think that it is necessary to construct it, as it is not absolutely necessary. As it is, other forms no more extensive may be employed that are entirely satisfactory.

Q. 125. In the defendants' device, marked Defendants' Tooth and Beam, is it necessary, in your opinion, to have a clamping bolt?

A. As constructed, I think it is.

Q. 126. In defendants' device, marked Defendants' Tooth and Beam, is it necessary that the several parts should be used in the manner indicated in order to operate and in order to comply with defendants' patent?

Counsel for the defendants objects to the question, because the patent has not been put before the witness.

A. Not having read the patent for a long time, I am unable to call to memory all the defendants' claim for this peculiar construction. Therefore I am unable to state definitely whether this exact construction is necessary to carry out all those points.

Q. 127. The defendants' patent, drawings, and specifications shown the witness and the question repeated.

Counsel for the defendants calls the attention of counsel for plaintiffs to the fact that he is making the witness his own.

A. In order to comply with the language of the claim in defendants' patent, it would be necessary to construct it similar to the manner shown in the exhibit; but, in answer to that portion of the question referring to the operation I would say I do not deem it essential that the device be constructed identically in the manner shown in the exhibit before me, but that the assumed construction would be substantially the same for all practical operations.

Q. 128. Do you consider that any change in the defendants' device, which would not change the operation of the tooth, would be substantially the same as the exhibit marked Defendants' Tooth and Beam?

A. That depends very largely upon what that change would be.

Q. 129. Do you consider, because two teeth have the same results, that it follows that the devices working the teeth operate the same.

A. Not necessarily; in all cases they operate in the same manner, and by virtue of their different construction, they may give the same result in a different form of construction.

The further taking of this deposition was adjourned until September 11th, 1879, at 10 o'clock.

The further taking of this deposition was resumed on Thursday morning, September 11th, 1879, at 10 o'clock.

197 Q. 130. Mr. Bogle, in defendants' device, did I understand you to say that if the pivotal bolt was used as it now is in the device, and a set-screw used instead of the clamping bolt, it would not change the character of the device? If not, what did you mean to be understood in reference to your testimony on that point?

A. I meant to be understood as saying that if a set-screw properly applied were used instead of a clamping bolt, the operation of the tooth would not be materially changed. The office for which the

clamping bolt was used, so far as alignment is concerned, would be, in that respect dispensed with.

Q. 131. Using the pivotal bolt in the defendants' device in the exhibit marked Defendants' Tooth and Beam, how could you use a set-screw in the place of the clamping bolt and have the tooth operate?

A. Well, there are different ways that might be employed. One way would be to secure a plate to the side of the beam immediately opposite that portion of the shank upon which the clamp is desired, and by passing a set-screw through this plate, the plate being provided for that purpose, the set-screw with a suitable point brought in contact with the shank to force it against the opposite jaw with sufficient force to retain it in position. Assuming this construction, it might be preferable to use the bar solid, instead of slotted, at the end; or it might be secured by means of a clamp; or, if the bar were sufficiently heavy, it would answer the purpose without a clamp. There are other methods of applying the set-screw, which might be preferable to the one in the device. It would necessitate a little different construction, so far as the slot or mortise is concerned.

Q. 132. Would you consider such a change as you have described a patentable difference?

A. Not patentable in the present state of the art, I should think.

Q. 133. What do you mean by the present state of the art?

A. I mean that, substantially, the changes I have suggested have been in use and well known, that alone being a sufficient reason why it would not be patentable.

Q. 134. Are not well-known uses applied differently by different forms patentable?

Counsel for the defendants objects to the question. These abstract questions cannot be decided in this case, and it is perfectly idle to waste time in questions of patent law, and they cannot be decided without specific reference to the devices and the object accomplished and the state of the art.

A. I do not know that I exactly understand what counsel means by the term "well-known uses."

Q. 135. Is that all the answer you can give?

A. That is all the answer I have to give to your question.

Q. 136. Are not old devices, when used differently and in new form, patentable?

198 Counsel for the defendants objects to the question on the same ground, and to all questions that may be asked upon this line.

A. When an old device is discovered to perform a new function, and is constructed with reference to that function, I believe it may be patented for that specific purpose. I think, however, in that case it would be limited strictly to the combination in which it was used.

Q. 137. May not old devices, when used differently and in new form, performing the same function, be patentable?

A. If at all, the patent would limit them to their specific construction.

Q. 138. Then would not the change in the form of defendants' tooth in evidence, which you have described heretofore in your evidence, be patentable as a specific construction?

A. I think not, for the reason that, assuming that construction, we have produced nothing new.

Q. 139. As a device, is not a set-screw different from a clamping bolt?

A. It is somewhat different in construction; but, in this case, the set-screw and the clamping bolt performed the same office, and both are old. Therefore the substitution of a set-screw for a clamping bolt, in this device, would not be, in my opinion, a patentable feature.

Q. 140. With a set-screw placed as you have described it, in the change in the defendants' tooth acting against the shank of the tooth, would the compressing power act in the same manner on the tooth, and in the same direction, and to the same extent as it does in the device of the defendants in evidence?

A. So far as retaining the shank in position is concerned, it would be clamped between the point of the set-screw and the opposite bar in such a manner as to produce the same result that the clamping bolt now does. With reference to the degree of pressure you might or might not obtain the same degree. That depends on circumstances. The same degree, however, is not necessary for practical uses, if the friction is sufficient to hold the tooth in place or work.

Q. 141. Then you consider no device patentable, do you, which operates generally in the same manner and performs the same function?

A. I think I answered that question. I refer to my former answer on that.

Q. 142. Counsel repeats the question and insists on an answer.

A. I give the answer in the language given in a preceding answer, and request the examiner to read it.

Q. 143. The former question and answer repeated.

A. The WITNESS: The question being re-read by the examiner, the word "no" was understood by me to have been given as the word "old," and my answers immediately preceding this
199 were given with that understanding. I will now answer the question as I understand it to be. A device may operate in the same manner and perform the same functions, but may be differently constructed, and may therefore be patentable in its distinct features.

Q. 144. Have you ever made either a tooth or a device like the plaintiffs' exhibit, marked Plaintiffs' Tooth and Beam?

A. I have not personally constructed such a device.

Q. 145. Do you know of your own knowledge the cost of such a tooth or such a device?

A. I can estimate it very nearly, sir, from my own knowledge.

Q. 146. What is the cost of the manufacture of the plaintiffs' tooth?

A. Do you mean that I shall estimate the cost of the entire tooth, including material?

Q. 147. I mean you shall do just what I ask. I repeat the question. What is the cost of the manufacture of the plaintiffs' tooth?

A. I think the question indefinite in the use of the term "what does it cost to manufacture." That may apply to include the material, or it may simply imply the cost of the construction. That is what I wish to understand, and is what I ask to be enlightened on.

Q. 148. What is the cost of manufacturing the plaintiffs' tooth, including material and work? Is that plain enough for you?

A. Yes. Estimating at the present price of material, the cost would be something like fifteen and three-fourths cents each. It might vary something from that, but not materially, I think.

Q. 149. What is the cost of the plaintiffs' device, marked Exhibit Plaintiffs' Tooth and Beam, to manufacture, including material and work?

A. I think it would be in the neighborhood of twenty cents.

Q. 150. What is the cost of manufacturing the defendants' tooth, including the material and labor?

A. I estimate the cost of the defendants' tooth, including material, at fourteen cents each.

Q. 151. The cost of the defendants' device, marked Defendants' Tooth and Beam?

A. The entire cost of the defendants' exhibit, including the braces in the front of the bar for securing it to the drag-bar, I estimate at about twenty-four and one-half cents each, not including the chains. Without the braces on the front end of the drag-bar by means of which it is attached to the drag-bar, I estimate the cost of the bar and tooth alone, complete, not including the chains, to be about eighteen and one-half cents.

Q. 152. Do you estimate the cost of the braces in the defendants' exhibit referred to on the front end of the drag-bar used for holding the bar in position at six cents each bar?

200 A. That estimate includes the bolts, braces, material cutting, and punching.

Q. 153. Then you call them six cents?

A. Yes.

Q. 154. Do you estimate the cost and labor of manufacturing the drag-bar in the two devices the same?

A. There is a little less material in the defendants' drag-bar, consequently it would cost a trifle less; but in my estimate I have figured them at the same.

Q. 155. Are there not the same number of bolts to hold the tooth in position in the one as there is in the other?

A. The defendants' brace has two bolts. The plaintiffs' exhibit is one bolt and one pin.

Q. 156. Which would cost the less, the two bolts in the defendants' device, or the bolt and pin in the plaintiffs'?

A. The bolt and pin would cost a fraction less than the two bolts.

Q. 157. Did you call them the same in your estimate?

A. I believe I did not discriminate in that respect.

Q. 158. In what respect does the plaintiffs' tooth cost one and three-fourths cents more than that of the defendants'? State particularly.

A. In my estimate I estimated the cost of welding the brace to the shank at two and one-fourth cents each. The rest of the labor performed on the shank is estimated at the same that it is in the defendants'. The material used in the defendants' device is estimated at one-half cent more than in the plaintiffs' device. That being deducted from the additional cost of welding the braces gives the figures in my estimate, namely, one and three-fourths cents, in favor of the defendants' device.

Q. 159. Will you please explain, if the cost of the plaintiffs' tooth is one and three-fourth cents more than the cost of the defendants' tooth, how the cost of the plaintiffs' device is one and one-half cent more than the cost of the defendants' device, the cost of material and labor in making the drag-bars being the same, as you have stated in your estimate?

A. I do not know that I said anything about one and one-half cents. I think I made a mistake, perhaps, in my figures of the discrepancy spoken of by counsel, namely, the difference between one and one-half and one and three-fourths cents.

Q. 160. Have you, at any time, and, if so, at what time, purchased any interest in the patent granted to C. Atwood, April 24, 1868, No. 54089, for an improvement in gang-plows; and, if so, for whom?

A. Some time during the year 1878, I think it was, I purchased the patent from C. Atwood for an improvement in gang-plows, dated April 24, 1856, No. 54089, the same being purchased for the benefit of Thomas, Ludlow & Rogers, Springfield, Ohio.

201 Q. 161. Look at the device marked Atwood Plow. In your opinion, is the construction of this plow similar to that marked Exhibit Plaintiffs' Tooth and Beam?

A. I think it is very similar in principle.

Q. 162. Question repeated.

A. Relating to the shank of the brace and means of holding it in position for work, I think they are substantially the same for practical purposes. With regard to the difference in the two devices, the plaintiffs' device is provided with a curved shank and a small steel shovel, while the Atwood device is provided with a mold-board share and landside, which renders this part of the construction different from that of the plaintiffs'. But the device in its combined parts is substantially the same as the plaintiffs' device. Therefore, as before stated, they are, I think, the same in principle and construction, so far as those parts of the two devices are designed to perform similar functions.

Q. 163. Do you claim that the device for holding the plow in position in the Atwood device referred to is similar to the device in the construction in that of the plaintiffs' for holding the shank of the shovel in position?

A. I consider it quite similar in principle, and substantially the same for practical uses. The Atwood device differs in construction in this respect. It has a straight brace attached to the shank by

means of a stud or bolt; has a closed slot or mortise instead of an open one, and is held in position by a set screw instead of a clamping-bolt. The several features render it similar to the plaintiffs' device in its mode of operation.

Counsel for plaintiffs asks that so much of the foregoing answer as is not responsive to the question may be stricken out.

Q. 164. In your opinion, is a mortise through a cast-iron strap like the strap at the end of the Atwood device similar in construction to the slot through a wooden beam as in the device of the plaintiffs', marked Plaintiffs' Tooth and Beam?

A. It differs in this respect, that it is closed at its rear part, while the plaintiffs' device is open. Therefore it differs in that respect.

Q. 165. In your opinion, is there any difference in a machine between the use of cast-iron in the place of wood for the same purpose, so far as the construction is concerned?

A. If the question refers to the devices referred to in the preceding question and answer, I would say the cast-iron strap referred to would cost something more, but I do not say that it would differ materially from wood if properly constructed for the use for which it is designed. The difference, however, in point of utility, I think would be in favor of iron.

Q. 166. Is the brace in the Atwood device referred to held in position by the compression of the sides of the mortise in the cast-iron plate, or by the action of the set screw applied directly against one side of the brace?

202 A. In one sense of the word it might be said to be held in position by means of the two jaws, and although held in position by means of the set screw, nevertheless the two jaws virtually form the clamping features of the device.

Q. 167. Are the two sides of the mortise in the cast-iron plate compressed together against the sides of the brace to hold it in position?

A. They are not.

Q. 168. In the plaintiffs' device, marked Plaintiffs' Tooth and Beam, is not the tooth held in position by means of the compression of the sides of the slotted wooden beam, compressed by the clamping-bolt?

A. Most certainly it is.

Q. 169. In this respect, is the action of the two devices similar?

A. They are not similar, so far as the adjustability or flexibility of the jaws are concerned. Without other means of clamping the tooth, neither of the devices would be practicable, the clamping-bolt in the one case and the set-screw in the other, I think, being equivalents.

Q. 170. What do you understand by equivalents? Define.

A. Any device that may perform the same function that is performed by a different device may be considered an equivalent for that purpose.

Q. 171. In your own opinion, would it make any difference that the device which performs the same *same* functions in others was

entirely different in manner of construction and manner of operation? Would one be the equivalent for the other?

A. For a specific purpose I should think that one would be equivalent to the other, both being designed to accomplish the same result, although they might differ somewhat in construction, and, to some extent, in their mode of operation.

Q. 172. Are you familiar with the claim made in the Atwood patent?

A. I have examined it, but not recently.

Q. 173. Does Atwood, in his patent, drawings, or specifications, claim any other purpose for the cast-iron plate with the set-screw placed against the brace, except to hold it in position?

A. Not having read the application or claims for some time, I do not remember distinctly with reference to his particular claims.

Q. 174. In your opinion, should not a patent, with the accompanying drawings and specifications, be construed with reference to the claim made by the patentee himself?

A. I think not. I do not think that the patentee should be held strictly to the language used in his application or his claims, unless they agree in all respects with his drawings and model, but that he should be entitled to his construction as shown, whether specified or claimed or not; for, in many cases, inventors are not conversant with the patent law, and the matter is left entirely with their
203 attorneys, who very often, not understanding the device or its uses, will fail to make a proper explanation or properly write the specifications and claims to cover the invention.

Counsel for plaintiffs asks that so much of the foregoing answer as is not responsive to the question be stricken out.

Q. 175. In your opinion, is a patentee entitled to any more than he claims in his specifications and drawings?

A. In my opinion, he is entitled to what he shows in his drawings and model, whether he claims them in his specifications or not.

Q. 176. Do you consider a metallic surface better for clamping purposes than a wooden surface?

A. In some cases, and for some purposes.

Q. 177. Do you consider metallic surfaces for clamping purposes better than wooden surfaces for clamping purposes for use in seeding machines for holding the tooth in position?

A. That depends upon the construction of the several parts.

Q. 178. How would it be with the defendants' device—metallic surfaces preferable to wooden jaws?

A. I think it could be so constructed that a metallic surface would be preferable in some respects; but I do not think for practical utility there would be much difference.

Q. 179. Would not the wooden beam, with slotted jaws like the beam of the defendants' and plaintiffs' in evidence, last as long, ordinarily, as the seeding machine with which it is connected?

A. I think it would, ordinarily, if constructed of proper material, which is not always the case however.

Q. 180. In your opinion, is the device of the plaintiffs', marked Plaintiffs' Tooth and Beam, patentable, so far as the Atwood plow in evidence is concerned?

A. Yes, I think it is entitled to a limited patent.

Q. 181. Is the plaintiffs' device, in your opinion, referred to, so far as the Gorham exhibit, marked Gorham Drag-Bar, is concerned, patentable?

A. Yes, I think in that case it would be entitled to a limited patent.

Q. 182. In your opinion, is the plaintiffs' device referred to, patentable, so far as the device marked Esterly Drag-Bar is concerned?

A. Yes, I think in that case it would be entitled to a limited patent.

Q. 183. How many seeding machines containing the drag-bar marked Exhibit Defendants' Tooth and Beam have Thomas, Ludlow & Rogers manufactured since the 31st of March, 1868?

A. I could not answer that question without referring to their books.

Q. 184. About how many?

A. I could not state.

Q. 185. State approximately.

204 A. I have no means whatever of even approximating it from recollection.

Q. 186. Yet you have been their general agent ever since that time until a few months ago?

A. Yes, but I do not carry the number of machines in my head for six or eight years.

Q. 187. Have they made ten thousand?

A. I should think not; but they may have made more and they may have made less.

Redirect examination:

Q. 188. In the direct examination your attention was called to the comparative cost of the plaintiffs' tooth, exhibit tooth and beam number two, as compared with the defendants. In your cross-examination you were asked to make the comparison with reference to the teeth in exhibit plaintiffs' tooth and beam? What is the difference in the cost between these two teeth of the plaintiffs'?

A. Estimating the material at the same price, the difference would be from two and one-half to three cents each. The tooth in the plaintiffs' tooth and beam number two costing the more.

Q. 189. What is their difference in weight?

A. I think it is a pound and one-half. I did not put down the figures. My recollection is that there is about a pound and a half in weight—pound and a half or pound and a quarter—about that. I don't remember which

Q. 190. Have you ever studied patent law with a view of fitting yourself as a patent attorney, or attorney for the practice of the law in patent cases?

A. I have not.

Q. 191. If, in legal parlance, a wheel would be considered the equivalent of a lever, when a mechanic of ordinary skill could readily substitute one for the other without invention, would you, on such basis, consider the Atwood set-screw used as a clamp the equivalent for the plaintiffs' clamp, both being well-known clamping devices.

Counsel for the plaintiffs objects to the question as calling for a legal conclusion and not a state of facts.

A. I certainly would consider it the equivalent.

Recross examination:

Q. 192. Is it not the additional cost of plaintiffs' tooth number two spoken of over number one, referred to, due entirely to the additional weight of metal used in it?

A. It is, in my estimation.

(Signature waived.)

205 Counsel for the plaintiffs asks that all the answers of the witness not responsive to the questions be stricken out.

A. R. LUDLOW, being first duly cautioned and sworn, testifies as follows:

Q. 1. What is your name, age, residence, and occupation.

A. A. R. Ludlow; age, fifty-three; Springfield, Clarke county, Ohio; manufacturer of farming machinery.

Q. 2. What kind of agricultural implements does your company manufacture, and how long have you been making them?

A. Our company has manufactured grain drills of the different kinds, hand cider mills, portable and corn cultivators; been making agricultural implements since 1865, and broadcast seeders since the spring of 1872.

Q. 3. What has been the character of your services in this company and its predecessors?

A. With its predecessors I was general superintendent. Since the formation of the stock company I have been president of the company, with a general supervision over all its departments.

Q. 4. What has been your mechanical experience?

A. My mechanical experience has been considerable in our business ever since we began.

Q. 5. You may go before that and state your mechanical experience.

A. Before going into this business I have been engaged in the different branches of mechanics ever since I was eighteen years old, forty years superintending and building houses and building machinery of different kinds, such as agricultural implements, waterwheels, &c.

Q. 6. Have you superintended the general construction of buildings?

A. Yes, sir.

Q. 7. You were a practical builder?

A. I was a practical builder.

Q. 8. Have you paid particular attention to the construction of machinery in your shop and the cost of construction?

A. I have paid considerable attention to the construction of all the machines built in the shop, and have many times suggested the adoption of certain machinery for cheapening the manufacture, etc.

Q. 9. Have you, during Col. Bogle's connection with the company, frequently reorganized the construction of the machines?

A. We have very frequently.

Q. 10. Who has generally been put in charge of this, so far as grain drills and seeders are concerned, or ordinarily?

A. Col. Bogle, as a general thing, has been put in charge of
206 the changes, for the reason that he was better acquainted with the trade, and knew better what was wanted than any of the rest of us.

Q. 11. How have you regarded his mechanical ability?

A. I have always regarded his mechanical ability in that direction as very good, perhaps superior to any of the rest of the company.

Q. 12. How would it be with mechanics in general on that class of machinery?

Counsel for plaintiffs objects to the question.

A. There is quite a difference in mechanics in general; the majority of them, not having any inventive powers or ideas, have to be directed how to perfect and bring out certain designs intended for improvements or something new. In that particular I would consider Col. Bogle rather an expert mechanic. For that reason, as before stated, he was put in charge of that class of work.

Q. 13. Have you made an estimate to arrive at the comparative cost of construction of the defendants' tooth and that of the plaintiffs'? If so, what would be the comparative cost of the plaintiffs' tooth as compared with the defendants' tooth, as shown in Exhibit Tooth and Beam number two and Plaintiffs' Tooth and Beam?

A. I have made an estimate of the comparative cost of the plaintiffs' tooth number two with the defendants' tooth exhibited before me, and find, according to my estimate, that the plaintiffs' tooth number two costs from two to two and one-half cents more than the defendants' tooth. As to the exhibit tooth of plaintiffs', I never made any estimate on it, but I see from the appearance of the tooth that exhibit number two is somewhat heavier than the exhibit proper, perhaps from one to one and one-quarter pounds lighter than number two, which would make, perhaps, the cost of the plaintiffs' exhibit very nearly the same cost as the defendants' exhibit.

Q. 14. As a general rule, the same amount of iron being used, which would cost the most to build, the defendants' or the plaintiffs', and why?

A. The same amount of iron and other material being employed, the plaintiffs' tooth would cost from two to two and a half cents more

than the defendants', for the reason that the plaintiffs' tooth has a brace welded on to the rear part of the shank, which requires a skilled mechanic to weld it on, and with a good deal of care in locating the same, and for the reason such would make it cost more than the defendants' from two to two and a half cents each standard.

Q. 15. Won't you please make a comparison between the differences of construction, mode of operation, and character of results attained by the plaintiffs' with the defendants' tooth and beam? State fully how they agree or differ, and state whether you consider it substantially the same or substantially a different device.

207 A. I do not consider the defendants' device like the plaintiffs' nor substantially like it. I see in the plaintiffs' tooth a standard and a brace welded on midway of the standard, and when the standard is put into the beam and set for operation the brace would impart to the standard a support in the rear that would prevent its bending, and, being placed so far back of the pivotal point, would afford quite a resistance to obstructions with the point; and I see that when placed in the beam that it has both a backward and a forward motion, so that, with a team stopping quickly, the rebound backward on the teeth would allow the teeth to pass backward or the brace to pass downward in the back end of the beam. I find in the defendants' device simply a shank with the top end of the same curved forward and fastened to a pivotal bolt, and passing down back of an alignment bolt, and perhaps a clamping-bolt, and when, as in the other case, a team may be stopped suddenly, and a rebound of the seeder, the tooth would not give forward as in the case of the plaintiffs', and would be liable to injure it for that reason. The curved part of the top of the tooth, in my opinion, acts simply as a frictional force, and has for itself no part of a brace in the sense of the word used by the plaintiffs, but works in the opposite, fits in the top of the tooth in such a way that there is more liability from the bending of the shank below the beam than there would be if it was straight; consequently I regard them as two entirely and distinct devices.

Q. 16. Suppose you did not desire to use an aligning bolt with defendants' tooth and beam, and did desire the tooth to yield or move forward in passing over an obstruction, could you or not obtain that result by the use of a single bolt? And, if so, state how.

A. By passing a single bolt through the shank of the tooth, the tooth and the pivotal bolt dispensed with, the tooth then would have liberty to go in either direction, back or forward. There might be a number of changes in the head of the tooth to produce the backward and forward movement, and that would operate practically just as well as the tooth does with its curved head and two bolts, as now constructed, provided it was given a sufficient sized head to produce the required friction.

Q. 17. Look at the defendants' exhibit, Modified Tooth and Beam, in which the pivotal bolt is removed and the clamping-bolt passes through the shank of the tooth to form a pivotal bolt for the tooth; would it, in your opinion, make a practical device, supposing the question of alignment was not desired?

A. Yes, sir; I think the device mentioned in the foregoing question would be such a one, if the alignment was not wanted, as would be a practical working tooth under ordinary circumstances. Now, I might go a little further and say that my reasons for saying so are that I have a great number of times tried the tension of the tooth in the manner in which I have tried the one before me just now, and also in the defendants' spring hose for drills, and have
208 cautioned the workmen in the shops not to make them or send them out too rigid for the purpose of guarding against breakages, and I am satisfied that the exhibit now shown me has friction enough without the pivotal bolt to make it practicable.

Q. 18. About what amount of tension is desired upon a slipping tooth for seeders and hose for grain drills?

Counsel for plaintiffs objects to the question.

A. I do not think that I can give the amount of tension in pounds, or define it in such a way as to give the exact force required to keep the tooth in position, but can tell more in taking hold of the bar and tooth and testing it with my hands and foot, as that has been my customary way of testing them.

Q. 19. Is it desired to have so great a strain upon the tooth that you cannot move it by a sharp blow of the foot practically?

Counsel for the plaintiffs objects to the question.

A. For practical working in the field the tooth should be left so that it could be kicked backward or forward with the foot.

Q. 20. Suppose, instead of using the clamping-bolt, you should use the rear bolt for a pivotal bolt alone, and place the set-screw, working in an iron nut, to bear against the forward curved portion of the tooth in the slot; would it or not, in your opinion, essentially change the character and operation of the defendants' modified device for practical purposes in the field?

A. The set-screw, placed in a metal nut and brought to bear on the forward end of the curve at the top of the tooth, could be used, in my opinion, very successfully on the device referred to; but in my opinion it would not change the value of the tooth either way very much, because the present value of the present form of the tooth is practicable, and the other could produce nothing (more) than a practicable tooth.

Q. 21. Properly made, which would be the most expensive, the one used with a set-screw, as described, or the one as used by you in the defendants' tooth and beam?

A. I think the cost of production would be about the same. The cost is so nearly the same, the difference in the cost being so slight, that I could not tell now what the difference would be, if any.

Q. 22. How is the defendants' tooth held in position for work, and how does it agree, in that respect, with the plaintiffs'?

A. The defendants' tooth is held in position by passing up through the beam with a curved end passing forward to the pivotal bolt and in the rear of the clamping and alignment bolt held by the top and forward end of the standard to the pivotal bolt between the slotted

end of the bar by the pivotal bolt and alignment or clamping bolt. The plaintiffs' device is held in position in the beam by a bolt passing through the top end of the standard, with a projecting brace through or near the center of the standard, backward and upward into the slotted beam, and there held in position by a clamping bolt, the distance between the head of the standard and the brace being about or nearly six inches, the distance between the bolt of the defendants' front end of the standard and where it passes down through the brace being in the neighborhood of about four inches. The difference in distance between the pivoted top of the shank and the brace in the plaintiffs' standard makes it more easily held in the slotted bar than that of the defendants'; notwithstanding the defendants' perhaps has more frictional surface in the tooth than the plaintiffs', the defendants' tooth having no support for the standard below the beam, and the plaintiffs' having a brace supporting the rear of the standard below the beam, make, in my opinion, the two standards two separate and distinct devices or teeth.

209

Q. 23. In your opinion, would the pivotal or clamping bolt in the plaintiffs' device be in any way dispensed with, and make one bolt perform the necessary function?

A. In my opinion, it could not be made a practical tooth in dispensing with the pivotal bolt, nor could it be made a practical tooth dispensing with the rear bolt.

Q. 24. How would the cost of such a tooth and brace and attachments as that shown in the device marked Eberly Tooth and Beam compare with plaintiffs' tooth and the attachments?

Counsel for plaintiffs objects to the question.

A. I think the Eberly tooth and brace and attachments referred to could be made cheaper than the plaintiffs' tooth, for the reason that there is little or no forging or bending about either the shank or the brace. The majority of the work of the Eberly, as shown me, can be done with a punch very cheaply. I should think that the Eberly tooth and brace presented to me could be made as cheap, if not cheaper, than any device that I have seen for that purpose. The difference in the cost of construction of the Eberly and the plaintiffs' I should think, in my opinion, would be about three to four cents each.

Q. 25. If properly made, would such a tooth and brace as the Eberly exhibit be practical, in your opinion, for the purpose of a slipping-tooth seeder?

A. It would, in my opinion, be entirely practicable for a seeder tooth; perhaps not quite so good as some others, on account of the brace going through trash.

Q. 26. Suppose I were to extend the beam backward, so as to have the brace project back in the rear, and pivot the tooth in the ordinary place in the center—half tenoning the end of the beam for the friction-bolt to engage the brace centrally with the beam—would it then be materially different in construction and operation, in your opinion, from the plaintiffs'? If so, state how.

A. If the brace were so changed as designated in the question, the device would be entirely practicable, not quite so liable
210 to gain trash as when in front, and would in practice be the same as plaintiffs', because then it would have both a back and forward movement; and the brace being the same distance in the rear of the shank, would in practice be the same as plaintiffs'.

Q. 27. Would such a change, in your opinion, make a materially different constructed device than that of the defendants?

A. I believe it would not.

Q. 28. Counsel for defendants asks the witness if he will make such a device and furnish it to the examiner, to be marked Modified Eberly No. 2, within the next week.

Counsel for plaintiffs objects, unless the device is produced now, so that he can have——

COUNSEL FOR DEFENDANTS: I have not got through yet. So that the plaintiffs' counsel can have the use of the same in his rebuttal testimony.

Counsel for plaintiffs objects to any such device being made or received in evidence, unless it is produced upon the examination of this witness, so that the plaintiffs' counsel can have the benefit of cross-examining the witness with reference to such device.

A. I will make such a device, and deliver it wherever desired, and to whom it may be desired.

Q. 29. Please do so, and deliver it to the officer, to be marked, in question.

Counsel for defendants further informs counsel for plaintiffs that he will produce the witness, if further time is desired for cross-examination.

Q. 30. Which would you regard the most durable as a clamping device, a metallic clamping device, such as a set screw, made in the manner referred to in your testimony, or a slotted wooden beam, for the purpose of holding seeder teeth?

A. In my opinion, the metal clamp would be preferable, for the reason that age and exposure will rot the wooden slotted bar, and will not rot the metal clamp. Therefore the metal clamp as used by farmers generally would be preferable to that of the wooden bar clamp. In machines as used by farmers the metal clamp would be preferable to the wooden one.

Cross-examination:

Q. 31. Are you one of the members of the firm of Thomas, Ludlow & Rogers?

A. I am. It is a stock company.

Q. 32. What is the name of the stock company?

A. It is the Springfield Agricultural Works, under the name of Thomas, Ludlow & Rogers. The company is composed of R. H. Rogers, J. W. Thomas, C. E. Thomas, A. R. Ludlow, and, to a

very limited extent, J. S. Ludlow, since the retirement of Col. Bogle.

211 Q. 33. Do you know the defendant in this suit?

A. I know one of them, and if you will allow me to go on, perhaps, in an indirect way, all of them, with the exception of one. I understand that there are two in the firm, I will not say company, at Milwaukee, that I never met or knew of but the one.

Q. 34. What was the name of your concern before it was formed into a joint stock company; several years immediately before?

A. Immediately before the change to a stock company it was Thomas, Ludlow, & Rogers.

Q. 34. Were the defendants in this suit the agents of your company that you speak of in selling seeders in the State of Wisconsin and contiguous territory?

A. Yes; they were and are our agents for the sale of seeders.

Q. 36. Have they been your agents for such purpose since the 31st of March, 1868?

A. They were not our agents until the spring of 1872, and a portion of the time since, up to the present time, they were not our agents. What length of time they were not our agents I am unable to say; what length of time between the spring of 1872 and 1879.

Q. 37. How many seeders have the defendants referred to, of the manufacture of your company, sold in the State of Wisconsin between the 31st of March, 1868, and the 1st day of January, 1878?

A. I have not the means to state how many, within my own knowledge.

Q. 38. Can you state about how many?

A. I would like to, if I could, but I cannot say how many; perhaps between two and four thousand, and may be not more than two.

Witness modifies his answer.

I did not understand the question and answer. To the best of my knowledge, for the whole State of Wisconsin, including all our agents in that State, I do not know that I can state any ways near the number sold by E. J. & Wm. Lindsay, of Milwaukee, not being particularly in charge of the shipment of machines or of the books. I cannot tell how many they had sold within the time specified, or even guess at it.

Q. 39. Do you know J. S. Bogle, of Springfield, Ohio.

A. I do, sir. I have known him for fifteen or sixteen years.

Q. 40. Did Mr. J. S. Bogle purchase for your company the C. Atwood patent for an improvement in gang-plows, dated March 24, 1866, No. 54089, and are you now the owner thereof?

A. I believe he did, and we are the owners now, of that patent, for some portions of the United States, and I do not know just how much.

Q. 41. Do you know I. J. Hibbard, the agents of the plaintiffs?

212 A. I do not know such person?.

Q. 42. Did you ever see him at your place of business in

Springfield, Ohio, in reference to taking a license from the plaintiffs for the use of the tooth in exhibit marked plaintiffs' tooth and beam?

A. If he is the man referred to in the former question I change my answer, and will say that I have seen him, and had some conversation with him in reference to the Rowell seeder tooth, and a license to use said device, but did not make any arrangements or proposition with him for the use of said device, for the reason that I claimed that we were in no way infringing on the Rowell tooth.

Q. 43. About what time was this? State as near as you can.

A. I have no means at my command to fix the date, but would say, to the best of my recollection, it was from two to two and a half years ago.

Q. 44. When Mr. Hibbard left Springfield, Ohio, did you go with him to the cars, or did you meet him at the cars?

A. I do not now remember whether I did or not either meet him at the cars or go with him to the cars.

Q. 45. How much license fee did he ask of you at that time for each seeding machine?

A. I think two and a half dollars for each seeder, with a rebate, I cannot recollect how much, for prompt payment.

Q. 46. Did you at this time, and at the place referred to, offer Mr. Hibbard the sum of fifty cents for each machine that you had then made in which were used teeth similar to this in exhibit marked Defendants' Tooth and Beam?

Counsel for defendants objects to the question, as offers of compromise and controversies are not evidence for any purpose.

Counsel for plaintiffs asks the question for the simple purpose of showing, at that time, the witness considered that he was infringing on the right of the plaintiffs.

Counsel for respondents replies that that fact would not show it, but that such offers are continually made for the purpose of settling controversies, and would have been cheaper than an expensive suit in this case, and he certainly would not have advised it as a compromise, and it does not prove the fact claimed.

A. My answer to the question is, that I rather ridiculed the idea of his charging two dollars and fifty cents for the seeder, and asked him the question if fifty cents would not be a large royalty on such a device, and made no offer for the use of it or for the patents, simply asking him if fifty cents would not be a good, round royalty for such a device, without making any offer whatever, and went farther and said that if proportionate charges were made on all the
213 patents contained in our machine, that such machinery would come so high that it would be beyond the reach of consumers in that line of goods. I do not know that it was the same man referred to in the question of the counsel for the plaintiffs, but I recollect distinctly of the man coming to our place and making such a demand.

Q. 47. Has your company, or the firm of Thomas, Ludlow & Rogers,

ever used the specific device, to wit, the tooth contained in exhibit marked Plaintiffs' Tooth and Beam?

A. Not to my knowledge; I think I would have seen such a device had it been made.

Q. 48. Has your company, or the firm of Thomas, Ludlow & Rogers, ever written, to your knowledge, to the plaintiffs, offering to pay them a license for the use of their device for use in the seeding-machines manufactured by your firm or such company?

Counsel for defendants objects to the question.

A. We had correspondence with that company, but none in regard to a license to use their device. Mr. Rogers being the correspondent and secretary of the company, I have never seen, perhaps, all the correspondence between the two companies.

Q. 49. Is there not a slot in the exhibit marked Defendants' Tooth and Beam similar to the slot in the exhibit marked Plaintiffs' Tooth and Beam?

A. There is such a slot corresponding with the one.

Q. 50. Are they not both for the purpose of holding the tooth in such exhibits by means of compressing the jaws of the slotted beam referred to against the tooth?

A. They are.

Q. 51. About what time did your company, or Thomas, Ludlow & Rogers, commence using a slotted beam similar to the exhibit marked Defendants' Tooth and Beam, for the purpose of holding the tooth by compression of the slotted jaws of the beam against the tooth?

A. My best recollection is that they began it when they first began to make seeders in the year 1872.

Q. 52. Did not both these exhibits, to wit, exhibit marked Plaintiffs' Tooth and Beam and exhibit marked Defendants' Tooth and Beam, compress the slotted jaws of the beam against the tooth by means of a clamping-bolt?

A. Yes; they do.

Q. 53. In both these exhibits, to wit, the exhibit marked Plaintiffs' Tooth and Beam and the exhibit marked Defendants' Tooth and Beam, are not the teeth in such exhibits held in position, that is, from slipping out of position, by means of pivotal bolts through the teeth?

A. No, sir; in my opinion, they are not both held alike in that respect.

214 Q. 54. I did not ask you if they were held alike.

A. They are so differently held that if, in the one case, the pivotal bolt were removed, it would destroy the use of the tooth entirely, and in the defendants' it would not.

Counsel for the plaintiffs asks that all the answer of the witness not responsive to the question be stricken out.

Q. 55. In the two devices, to wit, the device of the plaintiffs, marked Plaintiffs' Tooth and Beam, and the device of the defendants, marked Defendants' Tooth and Beam, is not the pivotal bolt used in each device?

A. Understanding the question as I now understand it, there is.

Q. 56. I understand you to say, do I, that if the pivotal bolt were removed from the device of the defendants referred to, the clamping-bolt remaining the same as now shown in the device, still it would be a practical tooth?

A. I mean that it would be a practical tooth so long as it did not meet with an obstruction sufficiently strong to draw the tooth backward in the beam.

Q. 57. Is not the device made for the purposes of meeting obstructions and giving away to pass over them?

A. They are.

Q. 58. Did I understand you to say that, in the plaintiffs' device just referred to, if the pivotal bolt is removed, the clamping-bolt remaining the same as it is in the device, that the device would be practically inoperative?

A. It would certainly be inoperative on account of its not having the clamping surface sufficiently large to hold it and the form of the tooth.

Q. 59. If the brace in the plaintiffs' device, just referred to, was enlarged, so as to afford the requisite clamping surface, with a clamping-bolt in the position as shown, with the pivotal bolt removed, would it not be operative?

A. I think not, in its present form, even then.

Q. 60. If the brace in the device of the plaintiffs, just referred to, was enlarged sufficiently, where it passes through the slotted beam, to afford the requisite frictional surface, the clamping-bolt being used the same as in the device, with the pivotal bolt removed, would it not be a practical device?

A. I am of the opinion that, in its present form, it would not.

Q. 61. What is the reason that in the form just mentioned the plaintiffs' tooth would be inoperative and the device of the defendants, as modified, to wit, with a pivotal (bolt) removed, and such modified device of the defendants operative; explain the difference?

A. On account of the different forms of the tooth. The defendants' device being a straight shank and wider in its shank, curving forward and back of the bolt, would afford it more resistance
215 than could be had upon the plaintiffs' device, especially in the rear, and the plaintiffs' device being in the "S" form on the rear of the brace, rather curving backward from the lower end of the brace, would make it harder to hold, in my opinion, than that of the defendants' device.

Q. 62. But if the plaintiffs' device referred to, as modified, had a sufficient amount of frictional surface where it passes through the brace, what is the reason it could not be held properly by means of a clamping bolt?

A. Because it is so shaped when the pivotal point is removed that, in my opinion, makes it very much harder to hold.

Q. 63. In the device of the defendants', marked Defendants' Tooth and Beam, in what part of the slot in the beam are the jaws closest together when compressed by the clamping bolt, front or rear?

A. I think a little the most pressure in the rear of the bolt.

Q. 64. Does not the iron forming the curve of the defendants' tooth in the device mentioned occupy for space four or five inches in the slot forward of the clamping bolt?

A. It does.

Q. 65. If the jaws of the slotted bar are closer together at the rear end of the beam, how does it afford much of any pressure forward of the clamping bolt?

A. I do not wish to be understood that the jaws of the beam are closer together in the rear of the bolt than they are in the front of the bolt. I wish to be understood that they clamp somewhat tighter in the rear of the bolt than they did in front of the bolt. I do not wish to be understood that the forward portion of the curve was not clamped. I wish to be understood that it is clamped, but not to such an extent that it is in the rear of the bolt.

Q. 66. If you should remove the pivotal bolt in the device marked Defendants' Tooth and Beam, leaving the rest of the device as it is shown, would it not be constructed according to the drawings and specifications of the patent granted to John L. Thomas and Joseph Thomas, of Springfield, Ohio, No. 152,706, dated June 30, 1874?

Counsel for defendants objects to the question for the reason (that he) has not been shown to be an expert in patents, drawings and specifications.

A. I do not know of my own knowledge whether it would or not.

Q. 67. If the pivotal bolt were removed in the exhibit marked Defendants' Tooth and Beam, the rest of the device remaining the same, would it not be a change in the construction of the device?

A. It would be a change in the construction of the device. It would then be liberated to such an extent that when the machine was stopped suddenly and a back rebound produced, the tooth then would be at liberty to go forward, as it would not when the forward bolt is used, and in removing the pivotal bolt you would lose the power of alignment, yet the seeder could be used.

216 Counsel for plaintiffs ask that so much of the answer as is not responsive to the question be stricken out.

Q. 68. If the pivotal bolt was removed in the device referred to, of the defendants, would not the operation of the device be changed, to wit, in the manner of moving forward as you describe it?

A. It would.

Q. 69. In the exhibit marked Defendants' Modified Tooth, is not the mode of construction of the device different from that of the exhibit marked Defendants' Tooth and Beam?

A. Yes, it is; in so far as the movement spoken of in the former answer is concerned, and the pivotal bolt is concerned.

Q. 70. In the device marked Defendants' Modified Tooth and beam, is not the pivotal bolt and is not the clamping bolt passed through the head of the shank of the tooth?

A. Yes; I believe it is.

Q. 71. Would not this device, marked Defendants' Modified Tooth, allow the tooth to have a forward motion?

A. It would.

Q. 72. In this respect, it is not different from the operation of the tooth marked Defendants' Tooth and Beam?

A. It is.

Q. 73. Do you consider defendants' modified tooth, in evidence, as practicable a tooth as the exhibit marked Defendants Tooth and Beam?

A. In some respects I would consider it better, in one respect on account of its forward movement when the machine is backing and the tooth in the ground; but on account of the alignment of the tooth not so good.

Q. 74. Would you consider the modified tooth referred to so far as holding in position is concerned, as practicable a tooth as the tooth marked Defendants' Tooth and Beam?

A. Yes; I think it would be held in position for all practical purposes, and would operate just as well as the other.

Q. 75. Do you consider the pivotal bolt, marked Defendants' Tooth and Beam, as of no account?

A. I do not want to be understood in that way. The pivotal bolt is useful as used in the defendants' device for the purpose of retaining the tooth together with the bar when meeting with obstructions, and is thrown out of the back end of the bar. In that case, the pivotal bolt is very useful to retain the tooth fast to the machine.

Q. 76. In the tooth marked Defendants' Modified Tooth, in order to hold the tooth in position in the slotted beam, equally as well as in the device marked the Defendants' Tooth and Beam, would it not be necessary to have greater frictional surface at the point where it is clamped in the beam?

217 A. To hold it equally as well in the modified device, it would be necessary to have more frictional surface in the rear of the clamping-bolt.

Q. 77. In this respect would it not be a change of the form of the tooth over the form of the tooth in the exhibit marked Defendants' Tooth and Beam?

A. There would be a change in that case.

Q. 78. If, instead of the pivotal bolt in the exhibit marked Defendants' Tooth and Beam, a set-screw should be used in the place of it, would not the device be a change in the construction?

A. Not materially, but slightly—mechanically.

Q. 79. Do you consider a pivotal bolt in construction similar to a set-screw?

A. I do consider a pivotal bolt similar in construction for the purposes of friction.

Q. 80. While the operation of a set-screw may produce the same result as a clamping-bolt, do you still persist in saying that the construction of a clamping-bolt and a set-screw are the same?

A. If the modified device is referred to, a set-screw would produce the same result that the pivotal bolt, and alignment or clamping-bolt would be the same if the set-screw as used in the modified device.

Q. 81. How does a set-screw operate? What is its mode of operation?

A. It can be used in different forms. It can be used as bearing against a surface with its end or clamp around the end. It can be used in bearing against or clamping around.

Q. 82. What do you mean by clamping around?

A. By passing a set-screw through or past the object and returning around the object desired to be held. In the one case, however, the object to be held would be pressed against the opposite wall, and, in the other case, it would be drawn against the wall next to the set-screw.

Q. 83. How would the set-screw operate in the device for holding the tooth by pressing against the sides, or the other way you mention?

A. By pressing against the opposite wall.

Q. 84. How does a clamping-bolt operate?

A. By drawing the object desired to be held to the wall next to the set-screw in the form of a hook.

Q. 85. In the device marked Plaintiffs' Tooth and Beam, are not the two sides of the slotted beam drawn against the tooth itself by means of the clamping-bolt?

A. They are drawn against the brace.

Q. 86. Is not the brace a part of the tooth?

A. It is.

218 Q. 87. Does the set-screw used for holding the tooth in position compress both the sides of the slotted beam against the tooth?

A. I think not. It presses one way from it, and presses the tooth against the other.

Q. 88. In the device marked Defendants' Modified Tooth, if a set-screw should be used so as to bear against the curved portion of the tooth, would not the construction of such a device be different than the construction of the defendants' tooth and beam?

A. It would.

Q. 89. In the device marked Defendants' Tooth and Beam, if the pivotal bolt should be removed, the clamping-bolt remaining as it is, and a set-screw placed so as to bear against the curved portion of the tooth, would not such a device, so modified, be different in construction from the defendants' tooth and beam?

A. I think it would be somewhat different.

The further taking of this deposition was adjourned over until Friday, September 12, 1879, at 9 o'clock a. m.

The further taking of this deposition was resumed Friday, September 12, 1879, at 9 o'clock a. m.

Q. 90. Mr. Ludlow, if a set-screw to hold the tooth, as you have described, was equally as effectual and equally as cheap by clamping in a slotted beam, why do you not use it in the manufacture of your devices?

A. I do not know that I stated whether it would be equally as cheap or not, but I think it could be made equally as effectual. I

A. Well, as regards my experimental knowledge of the workings of it, I know nothing about it, for I never used it.

Q. 11. Have you seen others use this plow, or one like it?

A. No.

Q. 12. When you bought this plow of Mr. Hollingsworth, did you examine its several parts with such great care and particularity as to fully fix in your mind the precise shape and construction of it?

A. I did; for it was a new pattern to me, and therefore I examined it critically.

Q. 13. Is it not possible that a change might have been made in this plow in some part or other in a greater or less degree since you bought it of Mr. Hollingsworth, which might escape your attention?

A. There could not be any change made there of any part of the article without the marks being shown on the paint, except that gauge that regulates the depth of the shovel that might have been raised or lowered.

Q. 14. Might it not be possible that that brace might be lengthened or shortened a little without you discovering it?

A. No, sir; it cannot; from this fact; it could not be done without it went to the fire, and if it went to the fire that would burn all the rust off.

Q. 15. Is this your only reason?

A. That is my only reason.

Q. 16. Could not the iron, by exposure to the weather from the time you bought it of Hollingsworth until a week ago, become rusty?

A. Yes; if it was new when I got if of Hollingsworth it could.

Q. 17. Would it not get rusty by exposure to the weather if it was old?

A. It might get more so than it was.

Q. 18. Is it not possible that this brace might be bent a little more than it was when you bought it and you not be able to discover it?

A. It might be, but I don't think it has been.

Then adjourned until 8 o'clock to-morrow morning, the 31st inst.

228 DECEMBER 31, 1873.

Resumed the taking of deposition of GRIFFITH HINCHMAN, on cross-examination:

Q. 19. If you had not seen this plow since you bought it of Hollingsworth, nor had any conversation with Gorham about it, would your recollection of the plow be as clear and distinct as it is now?

A. Yes; for I examined it critically, because it was a new pattern to me, and have described it to other folks long before I knew Gorham.

Q. 20. To whom have you described it, when, and where?

A. After I went to Hollingsworth and got the plow up here, it was a kind of casual remark that I made to my acquaintances

around here what I had done and what kind of a plow it was, but to whom I can't tell now, because I talked to so many.

Q. 21. Do you know a Mr. Phelps, of Wisconsin?

A. No.

Q. 22. About the 17th of this month did you see a gentleman on Main street, in this town, and have a talk with him about this plow, at or near the residence of Mr. Joel Evans, on the sidewalk?

A. It might have been about that date that I met two gentlemen at or near Joel Evans' office, and this gentleman here, Mr. Dick, was one of them; the other one asked me if I knew anything about a certain plow that came from Jabez Hollingsworth's. I told them I did, and that the regulating of the plow was a new feature to me. It had a curved regulator, and I took out my knife and marked the curve of it as near as I could on the side of Joel's office, and told them the nature of it; that it extended above the beam five or six inches, maybe a little over, and the lesser gentleman said that he would like to get my deposition.

Q. 23. You had not seen this plow at that time since you bought it, had you?

A. No; I did not know it was in this county, and it may not have been then.

Q. 24. Was not the brace, as you described it to these gentlemen, less curved than this one now upon the plow?

A. No; if you will go up to the office I will show you the marks on the office I made to represent this brace, and it is more curved than this brace; Mr. Dick says I did not make any marks; now I want to refresh his memory; he took out his pencil and made a straight mark nearly across the curve of the one I made, and asked me if it did not run more that shape, and I told him no.

Q. 25. If the person who had owned this plow since you sent it to Eberly should swear that the plow had been changed since he owned it, then what would you say about the plow being the precise shape it was when you bought it of Hollingsworth; are or are you not mistaken?

A. As regards that, I see no chance for any change being
229 made without the irons showing it, and I see no signs of it ever having been changed.

Q. 26. But may you not possibly be mistaken or have forgotten?

A. I may have forgotten, but I don't see any chance to be mistaken, for any alterations being made it would show.

Q. 27. Did you notice that mark across the beam of the plow when you bought it?

A. Not particularly, I did not. That has been made by raising and lowering the gauge.

Q. 28. Was or was not that precise wedge in there when you bought the plow?

A. I don't know whether it was or not.

Q. 29. Do you know of your own knowledge whose make of plow that is?

A. No; no more than what I have heard.

Q. 30. How much did you give Hollingsworth for that plow?

A. Two dollars and a half. I would not give two cents and a half for it for my own use.

Q. 31. How did you buy the plow so cheap of Hollingsworth?

A. I went down there, according to instructions in the letter, to get the plow and buy it if I could. I asked Hollingsworth if he had a shovel-plow of David Eberly's make, and he said yes. He went to the crib and put it out. I asked him what he would take for it. He said three dollars he thought it was worth. He said he had not used it but very little for the last year. I told him if that was the case he better take two dollars and a half and let me have it, for that much money would be worth more to him than the plow. He said take it, and I loaded it into the carriage and took it home.

Q. 32. Before giving your affidavit which Gorham wrote down, did not Gorham, in your presence, show and explain the construction and working of the plow?

A. No. I knew all about it before. I have no recollection of anything of the kind.

Q. 33. Where was this affidavit taken?

A. At the Hammell House.

Q. 34. Did or did not Gorham at that time talk with those present about the plow, and have it with him?

(First part of question objected to.)

A. He had the plow with him here, and while I was with him he was busy writing down the description and what I said, and then I left, and what he said to other folks I don't know.

(Signed) GRIFFITH HINCHMAN.

230 Also, JABEZ HOLLINGSWORTH, being duly affirmed, deposes and says, in answer to interrogatories propounded by J. E. HATCH, of counsel for defendants, as follows, to wit:

Q. 1. State your name, age, residence, and occupation.

A. My name is Jabez Hollingsworth; my age is sixty-two; my residence is near Freeport, Warren county, Ohio; my occupation, farming.

Q. 2. Please look at the plow now shown you marked "Exhibit A, Joel Evans, Notary Public, Warren Co., O.," and state when and under what circumstances you first saw it, and whether or not you ever owned and used it?

A. I am satisfied it is the same plow I bought of Eberly at the time he worked in Corwin, and sold to Hinchman, it being in my possession till about three years ago this winter, then sold to Hinchman without change further than using is concerned.

Q. 3. State whether or not you used it; and, if so, how it worked?

A. I used it for three or four years, and it worked, and I was satisfied with it, and thought it would give satisfaction to any person that wished a shovel-plow. The reason I thought so was because it could be changed or set to suit different persons the way they would wish to have one.

Q. 4. State how the shovel acted when it met with a solid obstruction in the ground in plowing.

A. It give back.

Q. 5. How far did it give back?

A. It would depend on the firmness of the catching and how far the horse went before he stopped. If he kept on it would give back until it dragged.

Q. 6. State whether or not while you used the plow, the beam, or shovel, or brace, were ever broken by meeting with an obstruction?

A. No.

Q. 7. Please state whether or not you used the plow the same season that you purchased it of Eberly, and give the full name of the Eberly of whom you say you purchased it.

A. Yes. David Eberly.

Q. 8. Please look at the photograph now shown you and marked "Exhibit B," and which is annexed to this deposition as part thereof, and state of what it is a photograph, and whether it is correct or not?

(Objected to.)

A. A photograph of the plow I bought of David Eberly, and which is marked "Exhibit A, Joel Evans, Notary Public, Warren Co., O.," and it is correct.

Q. 9. Please state whether or not the plow now shown you, marked "Exhibit A, Joel Evans, Notary Public, Warren Co., O.," is the same or different from what it was when you sold it to Hinchman.

231 A. It is the same.

Cross-examination by counsel for plaintiffs:

The witness corrects his answer to question nine, and adds with the exception of the key.

Q. 1. Put the plow in condition for working as you used it.

A. It is now in about the condition in which I used it.

Q. 2. Now describe it.

A. The whole. I don't know how full a description he asks. From anything I can see, it is its own model of description; it is without change. This is as full a description as I am able to give in truth.

Q. 3. How tightly was this nut turned up against the brace through the beam?

A. Sometimes it was tighter than at others, according to the hardness of the ground and the depth of the plowing. I have broke up ground with it.

Q. 4. State whether or not the bolt and nut through the brace and beam was for setting the shovel so it would plow deeper or shallower?

A. Both deeper and shallower.

Q. 5. Would it plow deeper or shallower in hard ground when so set, and do good work?

A. Yes.

Q. 6. Where is the pin now in this plow, through the shank of the shovel above or below the brace?

A. Above.

Q. 7. Is the key now in the plow the one in when you sold it?
A. There was no key there when I sold it.
Q. 8. State whether or not you used a key.
A. It was made with one. It soon lost, and there was never another made. I used the plow without a key more than with it a great deal.
Q. 9. State whether or not it was when you used the plow without a key that it slipped.
A. It slipped with and without a key.
Q. 10. How long did you use it with a key?
A. I can't tell; not long.
Q. 11. State as nearly as possible how long.
A. It was not through the first season.
Q. 12. In what year did you buy the plow?
A. I never named the year, but it was when he, Eberly, worked in Corwin.
Q. 13. About how many years ago did you buy the plow?
A. As near as I can come at it, it was about 1858.
232 Q. 14. State whether or not, by use, the shape of the brace may not possibly be changed since it was made.
A. I have not discovered any further than using or wearing, or something of that kind, may be concerned.
Q. 15. Would it not be natural in working in hard ground with a heavy strain on the brace that it would be changed more or less?
A. I think not in shape.
Q. 16. Were you sworn in October last at Milwaukee, Wis., in a suit pending in the United States circuit court for the eastern district of Wisconsin, wherein John Rowell and Ira Rowell were plaintiffs and the Harris Manufacturing Company were defendants, and did you give testimony therein in reference to this plow?
A. I was affirmed and did give testimony.
Q. 17. Was the testimony that you gave there true or false?
A. True.
Q. 18. Do you know George W. Elbon, who lives near neighbor to you?
(Objected to, as not responsive to anything in the direct exam'n, and for other reasons.)
A. Yes.
Q. 19. Have you seen him and talked to him since you came from Milwaukee?
(Objected to as before.)
A. Yes.
Q. 20. When and where have you seen and talked with him since your return from Milwaukee?
(Objected to as before.)
A. At his residence. I know not when.
Q. 21. How many times have you seen him?
(Objected to as before.)

A. I don't recollect of but the once.

Q. 22. Did you talk with George W. Elbon about being at Milwaukee, and about this plow?

(Objected to as before.)

A. I talked with him about being at Milwaukee. I think there was not much talk about this plow. I don't know that he ever seen it.

Q. 23. Did you at that time and place say to George W. Elbon that this plow looked like as if it had been changed?

(Objected to as before.)

A. No.

Q. 24. Did you at that time and place say to George W. Elbon that the plow looked like as if it had been changed, or words to that effect?

(Objected to as before.)

A. I did not.

Q. 25. Did you testify at Milwaukee, at the trial above named, that the plow might have been changed?

A. No.

Q. 26. Have you ever seen any other Eberly plow except this?

A. I seen one at Milwaukee; one that was said to be George Elbon's; that is all I recollect of.

233 Q. 27. Did you see two gentlemen have this plow, said to be George Elbon's, at Freeport or near there, in this county, two or three years ago, one day when you were going to meeting? State fully.

(Objected to.)

A. I don't recollect of seeing the plow any other time than at Milwaukee.

Q. 28. Did you or did you not at this time say to these men that the plow they had was like yours, meaning this plow?

(Objected to.)

Redirect examination:

Q. 29. Please state whether or not this plow, "Exhibit A," is constructed with the purpose of allowing the shovel to yield when it meets an obstruction, and whether the bolt passing through the beam and through slots in the brace is the means by which that is accomplished.

(Objected to, as calling for the opinion of an expert.)

A. Yes.

Q. 30. On cross-examination. State whether or not you wish to be understood that this brace is used for the purpose of setting the shovel so it will plow deeper or shallower.

A. That bolt through the beam is used to keep the shovel stationary, and to set it to suit the taste of the one that follows it.

(Signed) JABEZ HOLLINGSWORTH.

It is hereby stipulated that the above and foregoing copies of depositions of Griffith Hinchman and Jabez Hollingsworth may be read and used on the hearing and trial of the above-entitled action on the part of the defendants as fully as if taken on notice, the plaintiffs reserving the benefit of all exceptions to the testimony noted therein, such copies being considered the same as original.

Dated September 22, 1879.

JAMES J. DICK,
Solicitor and of Counsel for Complainants.

Circuit Court of the United States for the Eastern District of Wisconsin.

J. S. ROWELL and IRA ROWELL
vs.
E. J. LINDSAY and WM. LINDSAY. } In Equity. No. ——.

Examination of witnesses on behalf of the defendants under the 67th rule in equity, as amended, pursuant to notice.

Present: J. J. Dick for the complainants, and E. E. Wood for the respondents.

234 By request of parties, it is ordered that the depositions be taken by question and answer.

CARROLL ATWOOD, a witness produced on behalf of the defendants, being first duly sworn, deposeth and saith, in answer to interrogatories propounded to him by E. E. WOOD, Esq., of counsel for the defendant, as follows:

Q. 1. State your name, age, residence, and occupation.

A. Carroll Atwood; 46; Lebanon, Ill.; merchant.

Defendant objects to the taking of the testimony of witness for the reason that the residence and place of taking his testimony is not stated in defendants' answer.

Q. 2. Are you the inventor of the gang plow shown and described by letters patent number 51536 and 54089, dated Dec. 19th, 1865, and April 24th, 1866?

A. I am supposed to be the man.

Q. 3. Did you make and sell these plows?

A. We did for several years, at Lebanon, Ill.

Q. 4. When did you commence to manufacture them?

A. In the winter of '64 and '65.

Q. 5. How many did you make?

A. Only a few; I cannot tell how many.

Q. 6. Look at the exhibit now shown you marked Atwood Plow. Is that part of one of the plows made by you?

A. It is.

Q. 7. Is there not any defect in any portion of the plow?

A. Not any, except a broken casting in the rear of the beam which came forward farther and took another bolt.

Q. 8. What is the object of that casting; its set-screw and the brace passing up through the casting?

Plaintiff objects to the question. Objector: Patent itself shows what it is for.

A. It is in case the plow strikes obstructions, so that the brace may slip up and the plow back without breaking.

Q. 9. How was the depth of the furrow regulated?

A. It was by loosening that set-screw and running the brace up or down to throw the plow on heel or point.

Q. 10. When was your first plows put out?

A. My first gang plows were put out in the spring of sixty-five.

Q. 11. Was there any trouble with them; if so, what was it, and what, if anything, did you do to remedy it?

A. The trouble was in the place where that casting is;
235 there was an iron on there with a nut above and a nut below. The trouble was that it was rigid, and the beam would break instead of slipping. I got up this casting to remedy it, as you see there, and after that had no more trouble.

Q. 12. How soon did you make this change?

A. As soon as I found that the other was not what I wanted.

Q. 13. Was it or not the same season that the plows were put to work?

A. It was.

Q. 14. How many years did you continue to manufacture these plows?

A. Six or seven years.

Q. 15. About how many per year?

A. About 40 or 50, and two years I made a hundred a year.

Q. 16. What kind of work was done with these plows?

A. For breaking ground for corn or oats and other crops; the first plowing.

Cross-examination by J. J. DICK, counsel for plaintiff:

Q. 1. Are you the patentee named in letters patent referred to as No. 54089?

A. I am.

Q. 2. Are you acquainted with the language of the patent referred to?

A. I think I am.

Q. 3. In that patent, and the drawings and specifications accompanying it, did you or did you not state all you claim for the invention named therein?

Objected [to], as the patent was not before the witness.

A. Yes, sir; I did.

Q. 4. Who now owns the patent referred to?

A. Well, I could not tell all. Thomas Ludlow & Rogers owns my interest in Ohio, some other parties West that I do not recollect own some interest in other States.

Q. 5. When did Thomas Ludlow & Rogers buy your interest in Ohio?

A. Something over a year ago, I think.

A. Well, as regards my experimental knowledge of the workings of it, I know nothing about it, for I never used it.

Q. 11. Have you seen others use this plow, or one like it?

A. No.

Q. 12. When you bought this plow of Mr. Hollingsworth, did you examine its several parts with such great care and particularity as to fully fix in your mind the precise shape and construction of it?

A. I did; for it was a new pattern to me, and therefore I examined it critically.

Q. 13. Is it not possible that a change might have been made in this plow in some part or other in a greater or less degree since you bought it of Mr. Hollingsworth, which might escape your attention?

A. There could not be any change made there of any part of the article without the marks being shown on the paint, except that gauge that regulates the depth of the shovel that might have been raised or lowered.

Q. 14. Might it not be possible that that brace might be lengthened or shortened a little without you discovering it?

A. No, sir; it cannot; from this fact; it could not be done without it went to the fire, and if it went to the fire that would burn all the rust off.

Q. 15. Is this your only reason?

A. That is my only reason.

Q. 16. Could not the iron, by exposure to the weather from the time you bought it of Hollingsworth until a week ago, become rusty?

A. Yes; if it was new when I got if of Hollingsworth it could.

Q. 17. Would it not get rusty by exposure to the weather if it was old?

A. It might get more so than it was.

Q. 18. Is it not possible that this brace might be bent a little more than it was when you bought it and you not be able to discover it?

A. It might be, but I don't think it has been.

Then adjourned until 8 o'clock to-morrow morning, the 31st inst.

228 DECEMBER 31, 1873.

Resumed the taking of deposition of GRIFFITH HINCHMAN, on cross-examination:

Q. 19. If you had not seen this plow since you bought it of Hollingsworth, nor had any conversation with Gorham about it, would your recollection of the plow be as clear and distinct as it is now?

A. Yes; for I examined it critically, because it was a new pattern to me, and have described it to other folks long before I knew Gorham.

Q. 20. To whom have you described it, when, and where?

A. After I went to Hollingsworth and got the plow up here, it was a kind of casual remark that I made to my acquaintances

around here what I had done and what kind of a plow it was, but to whom I can't tell now, because I talked to so many.

Q. 21. Do you know a Mr. Phelps, of Wisconsin?

A. No.

Q. 22. About the 17th of this month did you see a gentleman on Main street, in this town, and have a talk with him about this plow, at or near the residence of Mr. Joel Evans, on the sidewalk?

A. It might have been about that date that I met two gentlemen at or near Joel Evans' office, and this gentleman here, Mr. Dick, was one of them; the other one asked me if I knew anything about a certain plow that came from Jabez Hollingsworth's. I told them I did, and that the regulating of the plow was a new feature to me. It had a curved regulator, and I took out my knife and marked the curve of it as near as I could on the side of Joel's office, and told them the nature of it; that it extended above the beam five or six inches, maybe a little over, and the lesser gentleman said that he would like to get my deposition.

Q. 23. You had not seen this plow at that time since you bought it, had you?

A. No; I did not know it was in this county, and it may not have been then.

Q. 24. Was not the brace, as you described it to these gentlemen, less curved than this one now upon the plow?

A. No; if you will go up to the office I will show you the marks on the office I made to represent this brace, and it is more curved than this brace; Mr. Dick says I did not make any marks; now I want to refresh his memory; he took out his pencil and made a straight mark nearly across the curve of the one I made, and asked me if it did not run more that shape, and I told him no.

Q. 25. If the person who had owned this plow since you sent it to Eberly should swear that the plow had been changed since he owned it, then what would you say about the plow being the precise shape it was when you bought it of Hollingsworth; are or are you not mistaken?

A. As regards that, I see no chance for any change being
229 made without the irons showing it, and I see no signs of it ever having been changed.

Q. 26. But may you not possibly be mistaken or have forgotten?

A. I may have forgotten, but I don't see any chance to be mistaken, for any alterations being made it would show.

Q. 27. Did you notice that mark across the beam of the plow when you bought it?

A. Not particularly, I did not. That has been made by raising and lowering the gauge.

Q. 28. Was or was not that precise wedge in there when you bought the plow?

A. I don't know whether it was or not.

Q. 29. Do you know of your own knowledge whose make of plow that is?

A. No; no more than what I have heard.

Q. 30. How much did you give Hollingsworth for that plow?

A. Two dollars and a half. I would not give two cents and a half for it for my own use.

Q. 31. How did you buy the plow so cheap of Hollingsworth?

A. I went down there, according to instructions in the letter, to get the plow and buy it if I could. I asked Hollingsworth if he had a shovel-plow of David Eberly's make, and he said yes. He went to the crib and put it out. I asked him what he would take for it. He said three dollars he thought it was worth. He said he had not used it but very little for the last year. I told him if that was the case he better take two dollars and a half and let me have it, for that much money would be worth more to him than the plow. He said take it, and I loaded it into the carriage and took it home.

Q. 32. Before giving your affidavit which Gorham wrote down, did not Gorham, in your presence, show and explain the construction and working of the plow?

A. No. I knew all about it before. I have no recollection of anything of the kind.

Q. 33. Where was this affidavit taken?

A. At the Hammell House.

Q. 34. Did or did not Gorham at that time talk with those present about the plow, and have it with him?

(First part of question objected to.)

A. He had the plow with him here, and while I was with him he was busy writing down the description and what I said, and then I left, and what he said to other folks I don't know.

(Signed) GRIFFITH HINCHMAN.

230 Also, JABEZ HOLLINGSWORTH, being duly affirmed, deposes and says, in answer to interrogatories propounded by J. E. HATCH, of counsel for defendants, as follows, to wit:

Q. 1. State your name, age, residence, and occupation.

A. My name is Jabez Hollingsworth; my age is sixty-two; my residence is near Freeport, Warren county, Ohio; my occupation, farming.

Q. 2. Please look at the plow now shown you marked "Exhibit A, Joel Evans, Notary Public, Warren Co., O.," and state when and under what circumstances you first saw it, and whether or not you ever owned and used it?

A. I am satisfied it is the same plow I bought of Eberly at the time he worked in Corwin, and sold to Hinchman, it being in my possession till about three years ago this winter, then sold to Hinchman without change further than using is concerned.

Q. 3. State whether or not you used it; and, if so, how it worked?

A. I used it for three or four years, and it worked, and I was satisfied with it, and thought it would give satisfaction to any person that wished a shovel-plow. The reason I thought so was because it could be changed or set to suit different persons the way they would wish to have one.

Q. 4. State how the shovel acted when it met with a solid obstruction in the ground in plowing.

A. It give back.

Q. 5. How far did it give back?

A. It would depend on the firmness of the catching and how far the horse went before he stopped. If he kept on it would give back until it dragged.

Q. 6. State whether or not while you used the plow, the beam, or shovel, or brace, were ever broken by meeting with an obstruction?

A. No.

Q. 7. Please state whether or not you used the plow the same season that you purchased it of Eberly, and give the full name of the Eberly of whom you say you purchased it.

A. Yes. David Eberly.

Q. 8. Please look at the photograph now shown you and marked "Exhibit B," and which is annexed to this deposition as part thereof, and state of what it is a photograph, and whether it is correct or not?

(Objected to.)

A. A photograph of the plow I bought of David Eberly, and which is marked "Exhibit A, Joel Evans, Notary Public, Warren Co., O.," and it is correct.

Q. 9. Please state whether or not the plow now shown you, marked "Exhibit A, Joel Evans, Notary Public, Warren Co., O.," is the same or different from what it was when you sold it to Hinchman.

231 A. It is the same.

Cross-examination by counsel for plaintiffs:

The witness corrects his answer to question nine, and adds with the exception of the key.

Q. 1. Put the plow in condition for working as you used it.

A. It is now in about the condition in which I used it.

Q. 2. Now describe it.

A. The whole. I don't know how full a description he asks. From anything I can see, it is its own model of description; it is without change. This is as full a description as I am able to give in truth.

Q. 3. How tightly was this nut turned up against the brace through the beam?

A. Sometimes it was tighter than at others, according to the hardness of the ground and the depth of the plowing. I have broke up ground with it.

Q. 4. State whether or not the bolt and nut through the brace and beam was for setting the shovel so it would plow deeper or shallower?

A. Both deeper and shallower.

Q. 5. Would it plow deeper or shallower in hard ground when so set, and do good work?

A. Yes.

Q. 6. Where is the pin now in this plow, through the shank of the shovel above or below the brace?

A. Above.

Q. 7. Is the key now in the plow the one in when you sold it?

A. There was no key there when I sold it.

Q. 8. State whether or not you used a key.

A. It was made with one. It soon lost, and there was never another made. I used the plow without a key more than with it a great deal.

Q. 9. State whether or not it was when you used the plow without a key that it slipped.

A. It slipped with and without a key.

Q. 10. How long did you use it with a key?

A. I can't tell; not long.

Q. 11. State as nearly as possible how long.

A. It was not through the first season.

Q. 12. In what year did you buy the plow?

A. I never named the year, but it was when he, Eberly, worked in Corwin.

Q. 13. About how many years ago did you buy the plow?

A. As near as I can come at it, it was about 1858.

232 Q. 14. State whether or not, by use, the shape of the brace may not possibly be changed since it was made.

A. I have not discovered any further than using or wearing, or something of that kind, may be concerned.

Q. 15. Would it not be natural in working in hard ground with a heavy strain on the brace that it would be changed more or less?

A. I think not in shape.

Q. 16. Were you sworn in October last at Milwaukee, Wis., in a suit pending in the United States circuit court for the eastern district of Wisconsin, wherein John Rowell and Ira Rowell were plaintiffs and the Harris Manufacturing Company were defendants, and did you give testimony therein in reference to this plow?

A. I was affirmed and did give testimony.

Q. 17. Was the testimony that you gave there true or false?

A. True.

Q. 18. Do you know George W. Elbon, who lives near neighbor to you?

(Objected to, as not responsive to anything in the direct exam'n, and for other reasons.)

A. Yes.

Q. 19. Have you seen him and talked to him since you came from Milwaukee?

(Objected to as before.)

A. Yes.

Q. 20. When and where have you seen and talked with him since your return from Milwaukee?

(Objected to as before.)

A. At his residence. I know not when.

Q. 21. How many times have you seen him?

(Objected to as before.)

A. I don't recollect of but the once.

Q. 22. Did you talk with George W. Elbon about being at Milwaukee, and about this plow?

(Objected to as before.)

A. I talked with him about being at Milwaukee. I think there was not much talk about this plow. I don't know that he ever seen it.

Q. 23. Did you at that time and place say to George W. Elbon that this plow looked like as if it had been changed?

(Objected to as before.)

A. No.

Q. 24. Did you at that time and place say to George W. Elbon that the plow looked like as if it had been changed, or words to that effect?

(Objected to as before.)

A. I did not.

Q. 25. Did you testify at Milwaukee, at the trial above named, that the plow might have been changed?

A. No.

Q. 26. Have you ever seen any other Eberly plow except this?

A. I seen one at Milwaukee; one that was said to be George Elbon's; that is all I recollect of.

233 Q. 27. Did you see two gentlemen have this plow, said to be George Elbon's, at Freeport or near there, in this county, two or three years ago, one day when you were going to meeting? State fully.

(Objected to.)

A. I don't recollect of seeing the plow any other time than at Milwaukee.

Q. 28. Did you or did you not at this time say to these men that the plow they had was like yours, meaning this plow?

(Objected to.)

Redirect examination:

Q. 29. Please state whether or not this plow, "Exhibit A," is constructed with the purpose of allowing the shovel to yield when it meets an obstruction, and whether the bolt passing through the beam and through slots in the brace is the means by which that is accomplished.

(Objected to, as calling for the opinion of an expert.)

A. Yes.

Q. 30. On cross-examination. State whether or not you wish to be understood that this brace is used for the purpose of setting the shovel so it will plow deeper or shallower.

A. That bolt through the beam is used to keep the shovel stationary, and to set it to suit the taste of the one that follows it.

(Signed) JABEZ HOLLINGSWORTH.

It is hereby stipulated that the above and foregoing copies of depositions of Griffith Hinchman and Jabez Hollingsworth may be read and used on the hearing and trial of the above-entitled action on the part of the defendants as fully as if taken on notice, the plaintiffs reserving the benefit of all exceptions to the testimony noted therein, such copies being considered the same as original.

Dated September 22, 1879.

JAMES J. DICK,
Solicitor and of Counsel for Complainants.

Circuit Court of the United States for the Eastern District of Wisconsin.

J. S. ROWELL and IRA ROWELL
vs.
E. J. LINDSAY and WM. LINDSAY. } In Equity. No. ——.

Examination of witnesses on behalf of the defendants under the 67th rule in equity, as amended, pursuant to notice.

Present: J. J. Dick for the complainants, and E. E. Wood for the respondents.

234 By request of parties, it is ordered that the depositions be taken by question and answer.

CARROLL ATWOOD, a witness produced on behalf of the defendants, being first duly sworn, deposeth and saith, in answer to interrogatories propounded to him by E. E. WOOD, Esq., of counsel for the defendant, as follows:

Q. 1. State your name, age, residence, and occupation.

A. Carroll Atwood; 46; Lebanon, Ill.; merchant.

Defendant objects to the taking of the testimony of witness for the reason that the residence and place of taking his testimony is not stated in defendants' answer.

Q. 2. Are you the inventor of the gang plow shown and described by letters patent number 51536 and 54089, dated Dec. 19th, 1865, and April 24th, 1866?

A. I am supposed to be the man.

Q. 3. Did you make and sell these plows?

A. We did for several years, at Lebanon, Ill.

Q. 4. When did you commence to manufacture them?

A. In the winter of '64 and '65.

Q. 5. How many did you make?

A. Only a few; I cannot tell how many.

Q. 6. Look at the exhibit now shown you marked Atwood Plow. Is that part of one of the plows made by you?

A. It is.

Q. 7. Is there not any defect in any portion of the plow?

A. Not any, except a broken casting in the rear of the beam which came forward farther and took another bolt.

Q. 8. What is the object of that casting; its set-screw and the brace passing up through the casting?

Plaintiff objects to the question. Objector: Patent itself shows what it is for.

A. It is in case the plow strikes obstructions, so that the brace may slip up and the plow back without breaking.

Q. 9. How was the depth of the furrow regulated?

A. It was by loosening that set-screw and running the brace up or down to throw the plow on heel or point.

Q. 10. When was your first plows put out?

A. My first gang plows were put out in the spring of sixty-five.

Q. 11. Was there any trouble with them; if so, what was it, and what, if anything, did you do to remedy it?

A. The trouble was in the place where that casting is;
235 there was an iron on there with a nut above and a nut below. The trouble was that it was rigid, and the beam would break instead of slipping. I got up this casting to remedy it, as you see there, and after that had no more trouble.

Q. 12. How soon did you make this change?

A. As soon as I found that the other was not what I wanted.

Q. 13. Was it or not the same season that the plows were put to work?

A. It was.

Q. 14. How many years did you continue to manufacture these plows?

A. Six or seven years.

Q. 15. About how many per year?

A. About 40 or 50, and two years I made a hundred a year.

Q. 16. What kind of work was done with these plows?

A. For breaking ground for corn or oats and other crops; the first plowing.

Cross-examination by J. J. Dick, counsel for plaintiff:

Q. 1. Are you the patentee named in letters patent referred to as No. 54089?

A. I am.

Q. 2. Are you acquainted with the language of the patent referred to?

A. I think I am.

Q. 3. In that patent, and the drawings and specifications accompanying it, did you or did you not state all you claim for the invention named therein?

Objected [to], as the patent was not before the witness.

A. Yes, sir; I did.

Q. 4. Who now owns the patent referred to?

A. Well, I could not tell all. Thomas Ludlow & Rogers owns my interest in Ohio, some other parties West that I do not recollect own some interest in other States.

Q. 5. When did Thomas Ludlow & Rogers buy your interest in Ohio?

A. Something over a year ago, I think.

Q. 6. Can you state more particularly the date of purchase?

A. I cannot.

Q. 7. Who owns your interest in the State of Wisconsin?

A. I think I sold to a party by the name of Sublett.

Q. 8. When you sold your interest in the patent referred to, was there anything said about you testifying about the working of the machine made under the patent; if so, what?

A. Not to the best of my knowledge, there was not.

236 Q. 9. Was there anything said about what the purshasers wanted the patent for; if so, what?

A. Not at the time it was purchased.

Q. 10. Look at exhibit marked "Atwood Plow, September 5th, 1879," and state if such plow is made according to the patent and its accompanying drawings and specifications?

A. It is.

Q. 11. What part of the patent and specifications describe the exhibit referred to? State fully in the language of the patent.

Objected to.

A. It refers to the plow exhibited. I cannot give the language of the patent.

Q. 12. What in the exhibit referred to do you designate as the plow-post?

A. Well, the main post that the beam is bolted on to.

Q. 13. What is this plow-post called, and how designated in the patent referred to, and its accompanying drawings and specifications?

A. I can't say exactly.

Q. 14. State as near as you can.

Objected to. Counsel for defendants tenders to plaintiffs' counsel a certified copy of the patent referred to, to facilitate the examination of the witness.

Plaintiffs' counsel shows to the witness the patent, drawings, and specifications tendered aforesaid.

Q. 15. State whether or not the following language used in the patent and specifications referred to, to wit: The plow-post, H 2, is fastened to its beam by a single bolt, *d*, so that the lower end of it may swing backward or forward as may be required to accommodate the length of the brace, H 3, which is fastened to the post by means of the bolt, *d'*, which admits alike longitudinal motion. The upper end of the brace, H 3, passes through a strap-piece, "C," attached to the rear end of the beam, H, and is there secured by means of the set-screw, C. The brace, H, may be adjusted so as to place the plow more or less forward, thereby throwing the point of it more or less elevated, and then the parts thus adjusted secured in position by tightening the set-screw, C', correctly described the exhibit referred to, and whether or not the exhibit is made according to such description?

A. The language correctly describes the exhibit, if I understand it.

Q. 16. Showing the witness the patent, specifications, and draw-

ing referred to. State what you claim in the patent, its accompanying drawings, and specifications in reference to the exhibit referred to?

A. I just offer the letters, patent, and specifications.

237 Q. 17. State whether or not you claim in your patent, specifications, and drawings, in reference to the exhibit referred to, anything more than the combination of the strap-piece *c*, and set-screw *c'*, with the beam H, and with the braces H 3, as and for the purposes set forth.

Objected to. The patent is the best evidence of what he claims?

A. No, sir.

Q. 18. At what places were the plows you referred to manufactured?

A. At Lebanon, Ill.; it is the only place I know of.

Q. 19. Were they all manufactured by you?

A. Yes, sir under my supervision.

Q. 20. State whether or not the plows referred to manufactured by you were similar in their parts to the exhibit referred to.

A. They were.

Q. 21. What is the object of the hole on the right side of your strap-piece?

A. Nothing; only that the drill was run clear through so as to top out easier.

Q. 22. What kind of material is the strap-piece *c* made of?

A. Cast-iron.

Q. 23. Is this cast-iron piece easily broken?

A. Not usually easily broken, though will sometimes break.

Q. 24. Were all the plows referred to manufactured by you, made with this strap-piece mentioned, closed solidly behind?

A. Yes, sir.

Q. 25. Were all the plows referred to manufactured by you, made with the strap-piece mentioned, in the same form and of the same size and of the same material as the exhibit referred to?

A. Yes, sir; as exhibit would be, if the piece broken off was on.

Q. 26. Are plows like the exhibit now manufactured?

A. Not to my knowledge.

Q. 27. Did these plows prove a success?

A. They did, sir.

Q. 28. Why, then, did you discontinue their manufacture?

A. Because gang plows went out of use.

Q. 29. You have stated that the object of the casting at the end of the beam, and its set-screw and brace, passing up through the casting, was, in case the plow meets with an obstruction, the braces may slip up and the plow back without breaking have you not?

A. Something to that effect; yes.

Q. 30. And you have stated, have you not, that you got out
238 the patent dated April 24th, 1866, No. 54089, to remedy this defect in a former patent, and to cover this as an improvement?

A. I did. I got up a device in spring of '65, the cast-iron piece

referred to, and put them on the plows made before, which would break the beam when they met with an obstruction.

Q. 31. Then why did you not make it a claim in your patent and specifications dated April 24th, 1866?

A. During the spring of '65, early, I made a model and specifications and sent them to Washington for a patent. I was delayed in getting the letters patent till the time specified by a party claiming an infringement; that is what caused the delay; during the time these plows I had them at work, and seeing that they was not what I wanted I put the cast-iron piece on.

Q. 32. Question repeated.

A. I don't know why it was not stated in letters patent, for it was the only improvement on that part of the plow.

Q. 33. Who owns now this patent of April 24th, 1866, in the State of Wisconsin?

A. I do not know.

Q. 34. State whether or not the adjustable clamp on the rear end of the plow beams, consisting of the casting mentioned, with the set-screw and brace, are for the purpose of adjusting the plows so as to throw the points of the plows more or less down.

A. Yes; down or up.

Q. 35. And when the plows are so adjusted, are they then fastened into position by means of the set-screw?

A. They are. And the screw is tightened up just tight enough so if the plow strikes an obstruction they let go.

Q. 36. Does not the specifications state that when the plows are so adjusted by means of the set screw, that the parts are secured in position by means of the set-screw?

A. I believe they do.

Q. 37. What material is the brace made of?

A. Wrought iron.

Q. 38. Has the plow marked Exhibit Atwood Plow been in actual use; and, if so, how long?

A. Yes; for six or seven years; long enough to wear it out.

Q. 39. Are there any marks or indications made by the set-screw on the brace, showing that in fact the casting has slipped up and down on the brace, as you claim it would?

A. Yes, sir; it is a bright space of six or eight inches where it slips.

Q. 40 Does the brace slip against the side of the set-screw?

239 A. When it strikes any obstruction it will.

Q. 41. Are there any marks made by the set-screw against the brace on this plow?

A. I think so.

Q. 42. If this brace slips up and down through the casting when it meets an obstruction, would the brace become bent?

A. Sometimes that might be the case; not often.

Q. 43. State the cost of manufacturing a brace, set-screw castings, and bolts.

A. When I was in business I charged one dollar and a half for each plow.

Q. 44. In what position is the plow when ready for use?

A. You place it up and down, owing to the depth you want to plow.

Q. 45. Would it be possible to, in ordinary cases, for the brace to be six or eight inches further above the top of the casting than it is now, the brace projecting now about four inches above the top casting?

A. It might be possible, but it would do no good. It just gets up so far and the plow runs out of the ground.

Re-examination:

Q. 46. Who took out your patents?

A. Randolph, of St. Louis. The last one, Munn & Co., of New York.

Q. 47. In the first patent, what was the nut above and below the iron in the rear of the beam for?

A. To set the plow and gauge the depth of the furrow.

CAROLL ATWOOD.

It is agreed by counsel for the parties that the foregoing depositions may be filed in this cause by counsel for defendant, without being forwarded by the officer before whom the same is taken.

STATE OF ILLINOIS, } ss:
County of St. Clair, }

I, Louis Zerwick, a notary public within and for said county, selected to act as special examiner, under the 67th rule in equity, as amended, in the cause stated in the caption, do hereby certify that the foregoing examination was had, pursuant to notice, at the office of H. H. Horner, in the city of Lebanon, on the 5th day of September, 1879.

I further certify, that at the said time and place I was attended by Caroll Atwood, witness produced on behalf of the defendant, he being of sound mind and lawful age, and the said witness was, previously to the commencement of his deposition, by me duly cautioned and solemnly sworn to testify to the truth, and
240 nothing but the truth, and the deposition hereinbefore appearing was reduced to writing by Frank Perin in the presence of and read over by me to said witness, and he thereupon subscribed to the same in my presence.

I further certify that I am not of counsel, nor attorney, nor relative of either of the parties to this cause, nor in any manner interested in the result thereof.

In testimony whereof, I have hereunto set my hand and affixed my seal of office, this 5th day of September, 1879.

[SEAL.] LOUIS ZERWICK,
Notary Public.

241 (65.)

Department of the Interior, United States Patent Office.

(Vignette.)

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters patent granted David Eberly December 22, 1857, No. 18894, for improvement in shovel plows.

In testimony whereof, I, W. H. Doolittle, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this twentieth day of March, in the year of our Lord one thousand eight hundred and seventy-nine, and of the Independence of the United States the one hundred and third.

[SEAL.] W. H. DOOLITTLE,
Acting Commissioner.

242 No. 18894.

UNITED STATES OF AMERICA.

(Vignette.)

To all to whom these letters patent shall come:

Whereas David Eberly, of Waynesville, Ohio, has alleged that he has invented a new and useful improvement in shovel plows, which he states has not been known or used before his application, has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are, therefore, to grant, according to law, to the said David Eberly, his heirs, administrators, or assigns, for the term of fourteen years from the twenty-second day of December, one thousand eight hundred and fifty-seven, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said David Eberly in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-second day of December, in the year of our Lord one thousand eight hundred and fifty-seven, and of the Independence of the United States of American the eighty-second.

[SEAL.] JACOB THOMPSON,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

J. HOLT,
Commissioner of Patents.

243 The schedule referred to in these letters patent and making part of the same:

To all whow it may concern:

Be it known that I, David Eberly, of Waynesville, in the county of Warren and State of Ohio, have invented a new and improved shovel plow, and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Fig. 1 is a side view of my improvement.

Fig. 2 is a plan or top view of do.

Fig. 3 is a detached plan of the device, by which the shares are adjusted so as to throw the soil either outward or inwards, or towards or from the beam.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a peculiar arrangement of means for adjusting the shares, whereby the same may be placed more or less angularly or obliquely with the ground, so that they may enter the same at a greater or less depth as desired, and also placed
244 so as to throw the soil either towards or from the rows, as may be desired.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the beam of the plow, and B B are handles, the lower or front ends of which are attached to the beam A by a bolt (*a*). The handles near their outer ends are connected by a cross-tie (*b*), and to this bar a slotted metal bar (*c*) is attached, the bar (*c*) being connected to an inclined post (*d*) by set-screws (*e*), the set-screws passing through the slot of the bar and into the post (*d*). The handles B B by this arrangement may have their outer ends adjusted at a greater or less height as desired, the front ends being allowed to turn on bolt (*a*).

C C are two metal bars which pass horizontally through the beam A, and are secured firmly in proper position by means of nuts (*f*) and shoulders (*g*). These bars project from the beam at opposite sides, as shown plainly in Fig. 2; and the outer end of each bar C has an eye formed on it to receive the upper end
245 of a bar D, which is secured thereon by a nut (*h*); the upper ends of the bars D have round tenons formed on them, which fit in or pass through the eyes of the bars C C.

To the lower end of each bar D a share E is attached. These shares are of the usual shovel form, or such as are generally known as shovel shares.

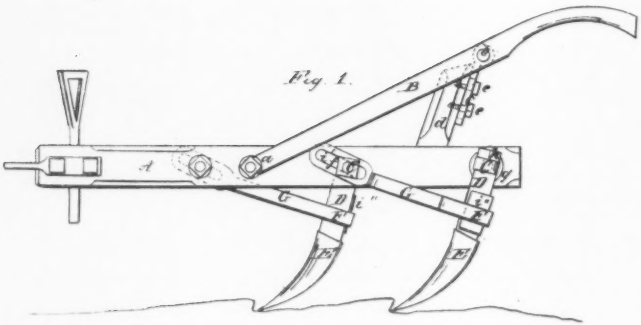
Each share bar D passes through a loop or eye F, formed in the back ends of bars G. These bars are bent or curved, as shown in Fig. 2, so that their front ends or parts may bear against the sides of the beam A, and be secured thereto, one by a bolt (*i'*) which passes through a longitudinal slot in the bar, and the other by the front bar C, which passes through a corresponding slot (*i*) in bar G, the

D. Eberly

Shovel Plow

No. 18894 Patented Dec. 22, 1857.

Fig. 1.



No. Powell Hal } p. 248
" Findlay Hal }

Fig. 2.

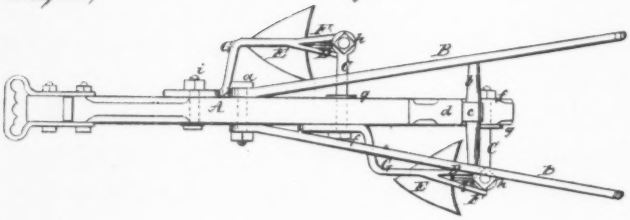


Fig. 3.

front bar C serving the double purpose of bar to hold its bar D, and bolt to secure the back bar G to the beam.

The loops or eyes F, of the bars G, are of triangular form, as shown clearly in Fig. 3, and the bars D are of flat form, and are wedged in the loops or eyes F by keys (*i''*), which may be placed at either side of the bars D.

From the above description it will be seen that the bars D,
246 and consequently the shares E, may be adjusted in positions, more or less inclined, by loosening the nut on the bolt (*i*), and that on the front bar C, so that the bars G may be drawn forwards or backwards, the bars C turning in the beam, the bars G being secured when the shares are adjusted as desired, by screwing up the nuts previously unscrewed. Thus it will be seen that the shares may be adjusted to penetrate the ground at a greater or less depth, as desired. The shares may be turned so as to throw the earth either from or towards the row—that is to say, towards the beam, or inwards—by placing keys (*i''*) at the outer sides of the bars D D, and placed in reverse position to throw the soil outward or from the row by placing the keys at the inner sides of the bars D, the tenons at the upper ends of the bars being allowed to turn in the eyes of the bars C.

It will be understood that a share passes along at each side of a row, so that both sides of the rows are plowed at once. By having the nut or bolt (*i*), as well as that on the front bar C, rather loose,
247 the share will be allowed to yield or give in case they come in contact with any obstruction. The shares thereby will be prevented from being broken in case the obstruction cannot be turned aside by the shares.

Having thus described my invention, what I claim as new and desire to secure by letters patent is—

Securing the shares E E to the beam A by having the upper ends of their bars D fitted in the bars C, the bars D also passing through the loops or eyes F of the bars G, and secured therein by keys (*i''*), the bars G being secured to the beam A, as shown, and the whole arranged substantially as and for the purpose set forth.

DAVID EBERLY.

Witnesses:
G. B. CARSON.
B. HAINE.

Ex.: J. A. W. M. McK.

(Here follows diagram, marked p. 248.)

249 (65.)

Department of the Interior, United States Patent Office.

(Vignette.)

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters patent granted Levi Haversticke April 2, 1850, No. 7241, for construction of drill teeth in seed planters.

In testimony whereof, I, W. H. Doolittle, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this twentieth day of March, in the year of our Lord one thousand eight hundred and seventy-nine, and of the Independence of the United States the one hundred and third.

[SEAL.]

W. H. DOOLITTLE,
Acting Commissioner.

250 No. 7241.

UNITED STATES OF AMERICA.

(Vignette.)

To all to whom these letters patent shall come:

Whereas Levi Haversticke, of Manortop, Pa., has alleged that he has invented a new and useful construction of drill-teeth in seed planters, which he states has not been known or used before his application; has made affirmation that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said invention, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said invention, and praying that a patent may be granted for that purpose:

These are, therefore, to grant, according to law, to the said Levi Haversticke, his heirs, administrators, or assigns, for the term of fourteen years from the second day of April, one thousand eight hundred and fifty, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used the said invention, a description whereof is given in the words of the said Haversticke in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this second day of April, in the year of our Lord one thousand eight hundred and fifty, and of the Independence of the United States of America the seventy-fourth.

[SEAL.]

T. EWING,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.

THOS. EUBANK,
Commissioner of Patents.

251 The schedule referred to in these letters patent and making part of the same:

To all whom it may concern:

Be it known that I, Levi Haverstick, of Manortop, in the county

of Lancaster and State of Pennsylvania, have invented a new and useful improvement in seed drills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which figure 1 represents a view, in perspective, of my machine; figure 2 is a vertical longitudinal section of the same; figure 3 is a vertical transverse section through a portion of the hopper; figure 4 is a section through the leg of the share, at the dotted line *x x* of figure 2; and figure 5 is an elevation of a portion of the machine, showing a modified arrangement of the spring-catch.

My invention consists in attaching the seed-tube or shank of each share to its respective share-beam by a hinge, the shank being also connected with the share-beam by an adjustable spring coupling, sufficiently rigid to hold it with its share in the proper posi-
252 tion for forming a furrow in earth, but which, when the share strikes an obstacle that would otherwise break the machine, being detached by the strain from the shank, allows the latter to turn backwards and pass over the obstacle. My machine is constructed to discharge the seed in a continuous stream, the rate of discharge being regulated by a register. It is also so arranged that any one or all the shares can be raised from the ground at will, while at the same time the discharge of seed to each share is stopped by the act of raising it.

In the drawing A is the frame of my machine on which the seed-hopper B, with its seed-roller C, are mounted, and which is supported on the axle D of the running wheels E E, the share-beams *a a a a* being hinged to its front cross-bar *b*. The machine represented in the drawing is constructed to deposite seed in four furrows formed by four shares, *h h h h*, each attached to a seed tube or shank F, through which the seed is dropped. Immediately above the shanks is the seed-roller C; this is formed of a series of grooved wheels, *c c c c*, attached to a shaft and corresponding in number and position with the shares; these wheels pass through openings in the
253 bottom of the seed-hopper and deliver the seed from the hopper to the shanks of the shares through suitable spouts and tubes *d*. The seed-roller is put in motion from the running wheels by cog wheels, (as shown at Fig. 2,) and turns in the direction indicated by the arrows in the drawing. The opening made at the back of the hopper for the passage of each grooved wheel is closed to prevent the waste of seed by a plate, *e*, fixed to the back of the hopper and fitted to the groove of the wheel; the rate at which the seed is delivered by the grooved wheel through the opening in the front of the hopper is regulated by an adjustable register-plate, *i*, which extends along the inner face of the front of the hopper, and has tongues depending from its lower edge which enter the grooves in the seed-wheels. By drawing this register-plate upwards the opening between the lower edge of the tongue and the bottom of the groove is enlarged, and at the rate at which the seed is discharged is proportionably increased, while, by depressing the register-plate, the opening, and consequently the discharge of seed, are correspondingly diminished. Each beam is hinged to the front cross-bar of

the frame in such a manner that the shank of the share is
254 held in an upright position, and each is connected with the lower extremity of a hand lever, *f*, hinged to the front of the hopper, by depressing the hinder end of which the beam, with its shank and share, is raised from the ground; the whole series of hand levers is surmounted by a bar, G, extending across the machine and hinged at each extremity to the front of the hopper by a radius bar, *g g*. This cross-bar is depressed by a hand lever, H, and, acting upon the whole series, beam hand levers *f f f f* raises the whole series of shares *h h h h* at once from the ground. Each hand lever is connected by a link, *k*, with an upright register plate, *l*, arranged to slide up or down over the large register plate *i*; the lower extremity of the register plate *l* is fitted to the groove of the seed-wheel, and when any one hand lever is depressed to raise its respective share from the ground this register plate, being connected with the hand lever, is depressed by the same operation, and closes the opening through which the seed is discharged, until it is withdrawn by the lowering of the share.

The seed tubes or shanks F are not rigidly secured to their respective beams, but each is connected therewith by a hinge, *m*,
255 on which it can turn backwards to pass over any obstacle which may occur in its path, and the shank is retained in its upright position by an adjustable spring-coupling, I; this is formed of two spring-plates, *n n*, united at one extremity, bent as represented (in figure 4), and connected with each other by a screw, *o*, so as to form a spring-vice, the jaws of which seize a rung, *p*, made for the purpose on the shank of the share. The force with which the jaws hold the shank is regulated by the screw *o* in such manner, that while it is held erect with sufficient force to form furrows in earth, yet when the share strikes an obstacle which would otherwise stop or break the machine, the pressure against the obstacle will drag the rung out from between the jaws, which open with the strain and allow the shank to turn backwards and pass over the obstruction. When the obstacle is passed the shank is returned to its position by the conductor of the machine.

A more simple modification of my invention is represented at figure 5. In this example there is but one spring-jaw, *n'*, the
256 upward pressure of which is opposed by the beam *a*; the spring-jaw catches beneath a rung, *p'*, secured to the shank, the force with which the shank is held in its position being regulated by a screw, *o'*, as in the former example.

The machine represented in the accompanying drawing and herein described is constructed with four shares to deposit seed in four furrows; but I do not confine myself to this particular number of shares, as more or less may be used, as circumstances may render expedient.

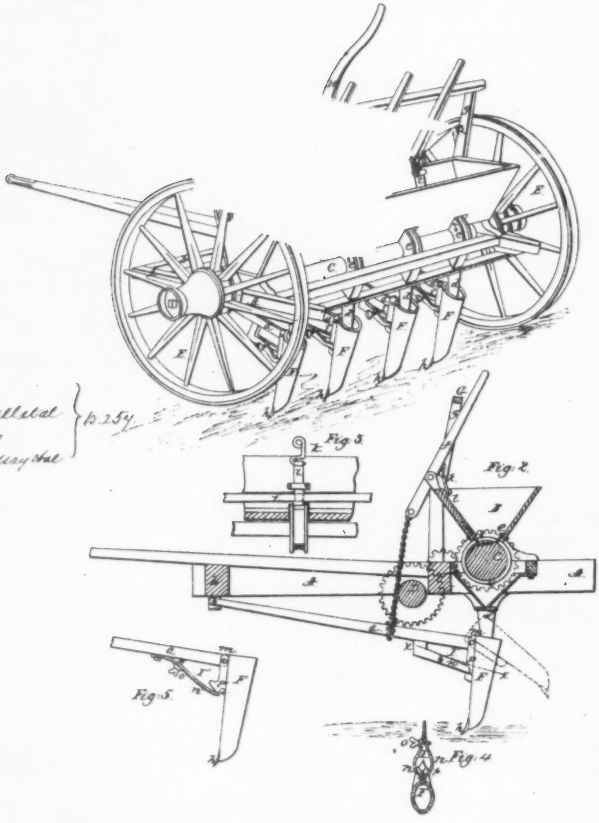
Having thus described my improved drill, what I claim therein as new and desire to secure by letters patent is the spring coupling constructed and arranged substantially as herein set forth.

LEVI HAVERSTICK.

L. Haverstick.

Grain Drill.

No 7,241. Patented Sept. 2, 1850.



No.
Rowell et al
vs
Lindsay et al
} p. 254

Witnesses:
C. S. WITTMER.
DAVID SAYLOR.

Ex'd F. F. L. M.

(Here follows diagram, marked p. 257.)

[The central portion of main figure being mutilated.—PRINTER.]

258 (65.)

Department of the Interior, United States Patent Office.

(Vignette.)

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters patent granted Fowler and Bacon March 28th, 1865, No. 47008, for imp't in hanging cultivator teeth.

In testimony whereof, I, W. H. Doolittle, acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this twentieth day of March, in the year of our Lord one thousand eight hundred and seventy-nine, and of the Independence of the United States the one hundred and third.

[SEAL.] W. H. DOOLITTLE,
Acting Commissioner.

259 No. 47008.

UNITED STATES OF AMERICA.

(Vignette.)

To all to whom these letters patent shall come:

Whereas Joseph Fowler and F. M. Bacon, of Watertown, Wisconsin, have alleged that they have invented a new and useful improvement in hanging cultivator teeth, which they state has not been known or used before their application, have made oath that they are citizens of the United States; that they do verily believe that they are the original and first inventors or discoverers of the said improvement, and that the same hath not, to the best of their knowledge and belief, been previously known or used; have paid into the Treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose.

These are, therefore, to grant, according to law, to the said Fowler and Bacon, their heirs, administrators, or assigns, for the term of seventeen years from the twenty-eighth day of March, one thousand eight hundred and sixty-five, for the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Fowler and Bacon, in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-eighth day of March, in the year of our Lord one thousand eight hundred and sixty-five, and of the Independence of the United States of America the eighty-ninth.

[SEAL.] W. T. OTTO,
Act'g Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.

D. P. HOLLOWAY,
Commissioner of Patents.

260 The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that we, Joseph Fowler and F. M. Bacon, of Watertown, in the county of Jefferson and State of Wisconsin, have invented, made, and applied to use a certain new and useful improvement in cultivator teeth, and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing making part of this specification, wherein—

Fig. 1 is a side elevation of said cultivator tooth;

Fig. 2 is a front view of the same; and

Fig. 3 is a section vertically through the tooth and jaw.

Similar marks of reference denote the same parts.

The nature of our said invention consists in a jaw receiv-
261 ing the upper end of the cultivator tooth, and having quadrant bearings for shoulders on the sides of the tooth combined with a tapering pin, or analogous device, to draw the shoulders on the tooth firmly against the quadrant bearings of the jaw, so as to retain the tooth in a vertical or in an inclined position, adapted to the particular use to which said tooth is applied, and if said cultivator tooth comes in contact with a stone, root, or other obstruction not easily removed, the shoulders slide on the quadrant bearings and the point of the tooth drags back and slides over such obstruction without being broken or injured, and is easily moved back to its place and retained as before by the friction of its shoulders against the quadrant bearings.

In the drawing *a* represents part of a bar or other device to which the cultivator tooth is to be applied, *b* is a divided jaw attached at 1
1 to the bar *a*, and formed with quadrant bearings 2 2, be-
262 tween which the stock 3 of the tooth *c* passes; 4 4 are shoulders on this tooth-stock at the surfaces of the quadrant bearings, and 5 is a tapering pin which, when driven in, binds the shoulders 4 4 against the surfaces of the quadrant bearings 2 2 and holds the cultivator tooth in any position where it may be placed. It will be understood that this tapering pin acts as a wedge against the upper side of the hole in the stock 3, and the undersides of the holes in the jaw *b*, and when undue strain comes upon the tooth in

Fowler & Bacon.

Cultivator Teeth.

No. 47,008. Patented Mar. 28, 1865.

Fig. 3.

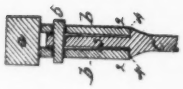
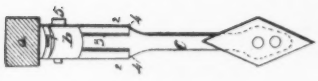
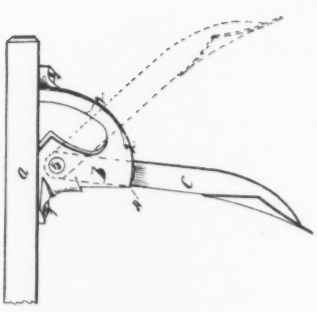


Fig. 2



No. Rowell et al } 2,264.
of Lindsay et al }

Fig 1



Witnesses
Charles H. Lucas
Henry P. Leibl

Inventor
Joseph Fowler
F. M. Bacon

consequence of its taking a stump, root, stone, or other obstacle, the friction between the surfaces of the quadrant bearings and the shoulders 4 4 is overcome and the tooth yields, drawing backward and upwards and passing over the obstruction.

The cultivator tooth itself may be of any desired character, and the whole employed with any usual frame or apparatus by which the tooth is held while being moved over the ground to act
263 as before specified, and it will be evident that the friction between the shoulders 4 4 and quadrant bearings 2 2 may be obtained by a set nut applied to an eye or jaw carrying the center pin 5 of the tooth *c*, or any analogous means may be employed instead of the tapering pin 5.

What we claim and desire to secure by letters patent is retaining the cultivator tooth by friction against a quadrant bearing substantially as specified, so that the said tooth can be in a vertical or in an inclined position and will yield to obstacles without injury to the tooth as specified.

In witness whereof, we have hereunto set our signatures, this 15th day of July, 1864.

JOSEPH FOWLER.
F. M. BACON.

Witnesses:
CHARLES M. DUCASS.
HENRY P. SEIBEL.

Ex'd: L. M. F. F.

(Here follows diagram, marked p. 264.)

265 (65.)

Department of the Interior, United States Patent Office.

(Vignette.)

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters patent granted C. Atwood April 24th, 1866, No. 54089, for improvement in gang-plows.

In testimony whereof I, W. H. Doolittle, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this twenty-fourth day of March, in the year of our Lord one thousand eight hundred and seventy-nine, and of the Independence of the United States the one hundred and third.

[SEAL.] W. H. DOOLITTLE,
Acting Commissioner.

266 No. 54089.

UNITED STATES OF AMERICA.

(Vignette.)

To all to whom these letters patent shall come:

Whereas C. Atwood, of Lebanon, Illinois, has alleged that he has

invented a new and useful improvement in gang-plows, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose.

These are, therefore, to grant, according to the law, to the said C. Atwood, his heirs, administrators, or assigns, for the term of seventeen years from the twenty-fourth day of April, one thousand eight hundred and sixty-six, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said C. Atwood in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-fourth day of April, in the year of our Lord one thousand eight hundred and sixty-six, and of the Independence of the United States of America the ninetieth.

[SEAL.]

W. T. OTTO,
Acting Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.

T. C. THEAKER,
Commissioner of Patents.

267 The schedule referred to in these letters patent and making part of the same:

To all whom it may concern:

Be it known that I, Carrell Atwood, of Lebanon, in the county of St. Clair and State of Illinois, have invented a new and useful improvement in "Gang Plows," and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Fig. 1 of the accompanying drawings is a plan of one of the improved plows.

Fig. 2 is a rear-end elevation of the same.

Fig. 3 is a sectional elevation taken on the line *a b*, in Figs. 1 and 2.

This invention relates, firstly, to the connexion between the forward end of the supporting-frame and plow-beams;

Secondly, to the adjustable connexion between the metallic headplate on the front of supporting-frame and the ends of the axle, whereby the whole machine may be adjusted to a correct alignment;

Thirdly, to a combination of levers and brakes for the purpose of keeping the plows in the ground while at work;

Fourthly, to the adjustable clamp on the rear ends of the plow-beams for the purpose of adjusting the plows by means of a movable brace, so as to throw the points of the plows more or less down.

To enable those skilled in the art to make and use my "Gang Plows," I will proceed to describe their construction and operation. The axle, A, the wheels, A^1, (not shown in model), and the supporting-frame, A^2, are of the usual construction in common use, and consequently will not be minutely described here.

The guiding frame for the plow-beams, composed of the metallic stands B B, and the beam B^1, the adjustability of these parts to different widths, and their connexion with the axle, are the same in detail as the similar parts in a patent already allowed to myself, consequently they will not be described here or alluded to any farther than they are connected with the parts especially incorporated in the present invention. C is a metal plate placed on top of the forward ends of the beams of the frame A^2, and fastened to them by means of the bolt "*a*," and beam-sockets a^2. Slots a^1 are made in the plate C for the passage of the fastening devices *a* and a^2, which, after passing through the plate C and frame A^2, are secured in position by means of the nuts, a^3, on the bottom of the frame A^2. By loosening these nuts the slot a^1 will admit of any desired regulation of the width of the frame, after which it may be again firmly secured by tightening up the nuts a^3.

On either side of the machine there is a brace or tie rod, D, the forward end of which is firmly secured to the plate C, while its back end passes through an eye-bolt or other similar device attached to the axle, and is there secured by the nut *b*. After the machine has been set up it may be correctly aligned by loosening one of the nuts *b* and tightening the other, and *vice versa*. A shaft, E, has its bearings in the lower ends of the stands B, between which points of support it is provided with a short lever, E^1, the outer end of which is arranged to hook on to a series of hooks on the lower end of the hook-rod F, which is suspended under the cross-bar G, to which it is securely attached by means of connecting links. The bar G rests on top of the plow-beams H. The driver's seat (not shown) should be located on the outer end of the beam B^1 at *s*, from which position he can easily place his foot on the lever E^2, the lower end of which is firmly attached to the shaft E. By pressing down the lever E^2 the driver can transmit, through the medium of the shaft E, lever E^1, and rod F, any required amount of pressure to the bar G, and thus hold the beams H down so as to keep the plows H^1 in the ground.

These devices are intended to overcome a difficulty experienced by farmers in keeping the plows in the ground in some kinds of soil, especially hard or stony ground. The plow-post, H^2, is fastened to its beam by a single bolt, *d*, so that the lower end of it may swing backward or forward, as may be required, to accommodate the length of the brace H^3, which is fastened to the post by means of the bolt d^1, which admits a like longitudinal motion. The upper end of the

brace H^3 passes through a strap piece, "c," attached to the rear end of the beam H, and is there secured by means of the set-screw c^1. The brace H may be adjusted so as to place the plow more or less forward, thereby throwing the point of it more or less elevated,
271 and then the parts thus adjusted secured in position by tightening the set-screw c^1.

Having described my invention, what I claim—

Firstly. Is forming the forward connexion between the beams of the frame A^2 of a metal plate C, having slots a^1 in it for the passage of the attaching devices "a" and "a^2," so that the machine may be readily adjusted to any width.

Secondly. The adjustable tie or brace-rods D, or their equivalents, when used as and for the purpose set forth.

Thirdly. The combination of the shaft E, levers E^1 and E^2, hook-rod F, and cross-bar G, or their equivalent devices, with the plow beams of gang plows for the purpose herein set forth.

Fourthly. The combination of the strap piece "c" and set-screw c^1, with the beam H and with the braces H^3, as and for the purpose set forth.

C. ATWOOD.

Witnesses:
W. N. RANDOLPH.
A. WAGNER.

Ex'd: E. A. M. H. M. H

(Here follows diagram marked p. 272.)

273 (65.)

Department of the Interior, United States Patent Office.

(Vignette.)

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters patent granted Henry Francisco, March 7th, 1865, No. 46654, for improved teeth for cultivators.

In testimony whereof, I, W. H. Doolittle, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this twentieth day of March, in the year of our Lord one thousand eight hundred and seventy-nine, and of the Independence of the United States the one hundred and third.

[SEAL.] W. H. DOOLITTLE,
Acting Commissioner.

274 No. 46654.

UNITED STATES OF AMERICA.

(Vignette.)

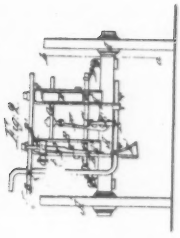
To all to whom these letters patent shall come:

Whereas Henry Francisco, of Lake Mills, Wisconsin, has alleged

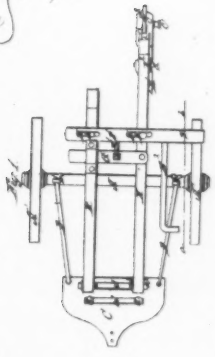
C. Atwood.

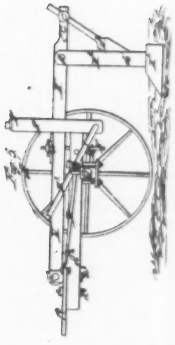
Gang Plow.

No. 54,089 Patented Apr. 24, 1866.



No. Rowell et al. } p 242
or. Lindsay et al. }





Witnesses
S. N. Randolph
A. Wagner

Inventor
C. Atwood
By his attys
S. N. Randolph & Co

that he has invented a new and useful improved teeth for cultivators, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said invention, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said invention, and praying that a patent may be granted for that purpose:

These are, therefore, to grant, according to law, to the said Henry Francisco, his heirs, administrators, or assigns, for the term of seventeen years from the seventh day of March, one thousand eight hundred and sixty-five, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used the said invention, a description whereof is given in the words of the said Henry Francisco in the schedule hereuuto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this seventh day of March, in the year of our Lord one thousand eight hundred and sixty-five, and of the Independence of the United States of America the eighty-ninth.

[SEAL.]

J. P. USHER,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.

D. P. HOLLOWAY,
Commissioner of Patents.

275 The schedule referred to in these letters patent and making part of the same:

To all whom it may concern:

Be it known that I, Henry Francisco, of Lake Mills, in the county of Jefferson, and State of Wisconsin, have invented a new and useful improvement in teeth for cultivators, and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Fig. 1 is a side elevation of my invention as it appears when being used for cultivating the soil.

Fig. 2 is a top view of the same.

Fig. 3 is a side elevation of the invention as it appears when thrown back by an obstruction.

Fig. 4 is a side elevation of the invention as it appears when thrown up & forward while backing or turning the machine.

Fig. 5 is a side view of the cultivator tooth disconnected from the beam or frame.

276 The same letters of reference in the several figures indicate corresponding parts.

Before setting forth the nature of my invention I will state that various contrivances which allow the teeth of cultivators to yield backwards to obstructions have been patented previously to this date, & my invention is an improvement on such plans and methods.

The nature of my invention consists in the eccentric form of the standard of the tooth in connection with the adjusting slide, by which the tooth may be set at any angle required to suit the nature of the soil in which it works, and the following results attained: 1st. Although the slide will hold the tooth in proper working position in all ordinary ground, it will yield whenever the tooth meets with any obstruction which offers a resistance sufficient to break the tooth or damage the machine, the yielding of the slide not being after the manner of a spring, but a retreat on a straight line away from the front of the tooth accordingly
276½ as the tooth gives to the resistance offered to it. The tooth being pivoted, its lower end rises and passes over the obstruction, thus saving the machine from damage. 2nd. The machine can be backed without the difficulty of having the teeth act as obstructors, or any liability of their catching in the ground. The eccentric form of the standard at once allows the tooth to move forward and upward free of the action of the slide. Third. These teeth will allow the machine to be turned square about without any attention from the person using it, for they will yield upward and forward to any back resistance; and in case the machine should be drawn from its rear end, and no wheels were used to support it, as in the case of a harrow or drag, very little resistance would be experienced; this latter benefit is of more importance while carrying the machine from one place to another. 4th. From the peculiar form of the upper and front part of the standard, no sods,
277 stubble or straw, roots, sticks or brush, wet dirt, or any other like obstruction will remain upon it, because these matters will glide up and fall off of their own weight.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is a beam of a cultivator; it is furnished with an oblong vertical slot, B, extending through it. This slot enlarges gradually from end to end as it descends through the beam. C is the tooth or standard for a shovel, D. The front edge of this standard is of *cima reversa* form, very nearly, and the back edge is nearly in form of a right angle with the corner rounded. The uppermost front portion of the standard stands farther forward of the angle or corner of the back edge of the standard than any other part, and from this point downward the front edge gradually stands nearer said corner
278 or angle. I now speak as though there was really a corner or angle at *a*, but, in fact, there is no angle or corner when the tooth is finished.

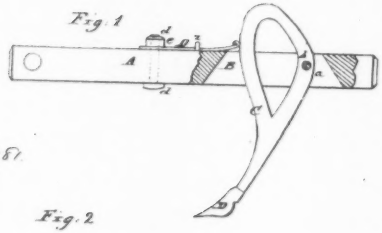
The tooth thus constructed is hung on a pivot *b*, which passes through the rear of the tooth, near the corner or angle *a*, thus making the tooth an eccentric in its operation upon the slide D′, which

H. Francisco.

Cultivator Teeth.

No. 46,664. Patented Mar. 7, 1865.

Fig. 1



No. Rowell et al } p. 287
or Lindsley et al }

Fig. 2

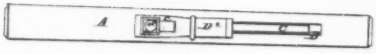


Fig. 3

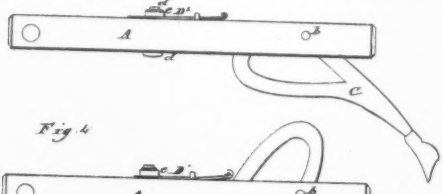


Fig. 4

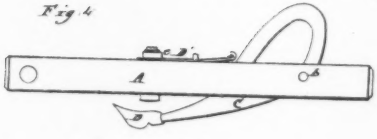


Fig. 5

Witnesses

R. J. Campbell
E. Baxter

Inventor:

Henry Francisco
by his Attys
Mason Fenwick & Lawrence

holds it in any desired position so long as the resistance to the point of the tooth does not endanger the machine.

The slide D′ above mentioned is fitted to the top of the beam A by means of a slot *c*, a screw-bolt *d*, & a nut *e*, as shown. By loosening the nut, the slide can be set up more or less toward the shank or standard of the tooth, and accordingly as it is set up, so will be the angle of the shank with the beam or ground. By this means the depth can be regulated at will, and to the nicest possible degree.

When the nut is screwed down upon the slide the hold of the slide upon the nut and beam is sufficient to ensure the reten-
279 tion of the tooth in any set position; but this hold is not so great as to prevent the tooth yielding and its shank sliding past the slide, the slide retreating forward from it when the tooth turns upon its pivotal connection.

As the tooth assumes the position shown in Fig. 4 the connection or bind between the slide and shank ceases, as will be evident from the drawing. This is owing to the eccentricity of the tooth. The reverse of this is the effect when the tooth moves backward in the slightest degree, and this is due to the eccentricity of the tooth, or the form and position of the same with respect to the slide.

What I claim as my invention, and desire to secure by letters patent, is—

1st. The eccentric standard to a cultivator tooth, constructed and operated substantially as described.

2nd. The slotted slide and set screw, arranged and operat-
280 ing in the manner and for the purpose described.

3rd. The combination of the set and retaining device, with the eccentrically hung shank of a cultivator tooth, substantially as & for the purpose described.

Witness my hand, in matter of my improvement in teeth for cultivators.

HENRY FRANCISCO.

Witnesses:
A. J. FOSTER.
H. B. WILLARD.

Ex'd: L. M. F. F.

(Here follows diagram, marked p. 281.)

282 (65.)

Department of the Interior, United States Patent Office.

(Vignette.)

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the files of this office of the file wrapper contents and drawing, in the matter of the letters patent granted C. Atwood, April 24, 1866, No. 54089 for improvement in gang plows.

In testimony whereof, I, W. H. Doolittle, Acting Commissioner of

Patents, have caused the seal of the Patent Office to be hereunto affixed, this eighteenth day of September, in the year of our Lord one thousand eight hundred and seventy-nine, and of the Independence of the United States the one hundred and fourth.

[SEAL.] W. H. DOOLITTLE,
Acting Commissioner.

ST. LOUIS, *April 6th*, 1866.

283 Hon. COM'R OF PATENTS:

SIR: Enclosed please find certificate for final fee for patent on C. Atwood's "Gang Plough."

Please send the patent to C. Atwood, Lebanon, Ill.

Yours, truly, M. RANDOLPH & CO.

[Endorsed:] Patent Office, April 10, 1866.

Petition.

284 To the COMMISSIONER OF PATENTS:

The petition of Carrell Atwood, of Lebanon, in the county of St. Clair, and State of Illinois, repectfully represents, that your petitioner has invented a new and useful improvement in gang plows, which he verily believes has not been known, nor used, prior to the invention thereof by your petitioner; he therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same, upon the terms and conditions expressed in the act of Congress in that case made and provided; he having paid fifteen dollars into the Treasury, and complied with the other provisions of said act.

And your petitioner hereby authorizes M. Randolph and Geo. P. Herthel, Jr., of the firm of M. Randolph & Co., of St. Louis, Mo., or their authorized agents, to act as his attorneys in pre-
285 senting this application, to sign his name to the drawings, and to alter or withdraw the same, as the case may require, and to receive the patent when granted.

C. ATWOOD.

[50. C. A., Dec. 4, 1866. 50.]

286 To all whom it may concern:

Be it known that I, Carrell Atwood, of Lebanon, in the county of St. Clair, and State of Illinois, have invented a new and useful improvement in "gang plows," and I do hereby declare that the following is a full and clear description thereof, reference being had to the accopanying drawings, and to the letters of reference marked thereon.

Fig. 1 of the accompanying drawings is a plan of one of the improved plows.

Fig 2 is a rear end elevation of the same.

Fig. 3 is a sectional elevation taken on the line *a b*, in Figs. 1 and 2.

This invention relates, firstly, to the connexion between the forward end of the supporting-frame and the plow-beams; secondly,

to the adjustable connexion between the metal-ic head plate on the front of supporting frame, and the ends of the axle, whereby the whole machine may be adjusted to a correct alignment; thirdly, to a combination of levers and brakes for the purpose of keeping the plows in the ground while at work, fourthly, to the ad-
287 justable clamp on the rear ends of the plow beams for the purpose of adjusting the plows by means of a moveable brace, so as to throw the points of the plows more or less down.

To enable those skilled in the art to make and use my "gang-plows," I will proceed to describe their construction and operation.

The axle A, the wheels A^1 (not shown in model), and the supporting-frame A^2 are of the usual construction in common use, and consequently will not be minutely described here.

The guiding-frame for the plow-beams, composed of the metal-ic stands B B and the beam B^1, the adjustability of these parts to different widths and their connexion with the axle are the same in detail as the similar parts in a patent already allowed to myself, consequently they will not be described here or alluded to any farther than they are connected with the parts especially incorporated in the present invention. C is a metal plate, placed on top of the forward ends of the beams of the frame A^2, and fastened to them by means of the bolts "*a*" and beam-sockets a^2. Slots a^1 are made
288 in the plate C for the passage of the fastening-devices *a* and a^2, which, after passing through the plate C and frame A^2, are secured in position by means of the nuts a^3 on the bottom of the frame A^2. By loosening these nuts, the slot a^1 will admit of any desired regulation of the width of the frame, after which it may be again firmly secured by tightening up the nuts a^3.

On either side of the machine there is a brace or tie rod, D, the forward end of which is firmly secured to the plate C, while its back end passes through an eye-bolt, or other similar device, attached to the axle, and is there secured by the nut *b*. After the machine has been set up it may be correctly aligned by loosening one of the nuts *b* and tightening the other, and *vice versa*. A shaft, E, has its bearings in the lower ends of the stands B, between which points of support it is provided with a short lever, E^1, the outer end of which is arranged to hook on to a series of hooks on the lower end of the hook-rod F, which is suspended under the cross-bar G, to which it is securely attached by means of connecting-links. The bar G rests on top of the plow-beams H. The driver's seat (not shown)
289 should be located on the outer end of the beam B^1 at *s*, from which position he can easily place his foot on the lever E^2, the lower end of which is firmly attached to the shaft E. By pressing down the lever E^2 the driver can transmit, through the medium of the shaft E, lever E^1, and rod F, any required amount of pressure to the bar G, and thus hold the beams H down, so as to keep the plows H^1 in the ground.

These devices are intended to overcome a difficulty experienced by farmers in keeping the plows in the ground in some kinds of soil, especially hard or strong ground. The plow-post H^2 is fastened to its beam by a single bolt *d*, so that the lower end of it may swing

backward or forward, as may be required to accommodate the length of the brace H^3, which is fastened to the post by means of the bolt d^1, which admits a like longitudinal motion. The upper end of the brace H^3 passes through a strap-piece "C," attached to the rear end of the beam H, and is there secured by means of the set-screw C^1. The brace H may be adjusted so as to place the plow more or less forward, thereby throwing the point of it more or less elevated, and then the parts, thus adjusted, secured in position by tightening the set-screw C^1.

290 Having described my invention, what I claim—

Firstly. Is forming the forward connection between the beams of the frame A^2 of a metal plate C, having slots a^1 in it for the passage of the attaching devices "*a*" and "a^2," so that the machine may be readily adjusted to any width.

Secondly. The adjustable tie or brace-rods D, or their equivalents, when used as and for the purpose set forth.

Thirdly. The combination of the shaft E, levers E^1 and E^2, hook-rod F, and cross-bar G, or their equivalent devices, with the plow-beams of gang-plows, for the purpose herein set forth.

Fourthly. The combination of the strap-piece "C" and set-screw C^1 with the beam H, and with the braces H^3, as and for the purpose set forth.

C. ATWOOD.

Witnesses:
WM. RANDOLPH.
A. W. WAGNER.

291 COUNTY OF ST. LOUIS, } ss:
State of Missouri, }

On this the fourth day of December, 1865, personally appeared before me, the subscriber, a notary public in and for said county, Carroll Atwood, whose name is subscribed to the foregoing specifications, and made solemn oath that he verily believes himself to be the first and original inventor of the improvement in "gang plows," described in the specification hereunto annexed, and that he does not know or believe the same was ever before known or used, and that he is a citizen of the United States.

Witness my hand and notarial seal the day and year above written.

[L. S.] WM. P. HANCOCK,
Notary Public.

[Five-cent revenue stamp. W. P. H., Dec 4, 1865.]

[Endorsed:] Rec'd & filed Jan'y 19, '66. J. D. P.

292 LEBANON, ILLINOIS, *May* 20, '66.

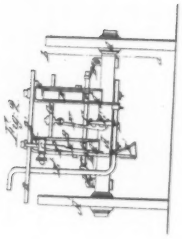
To the Commissions of Patents.

SIR: I wode like to now whene I cane git my patent for a improvement on a gang plow, which wore a loud about the first of March, and I want to now how sune I cane git hit. I half sent my last Patent Office fee to you about six weks a gou.

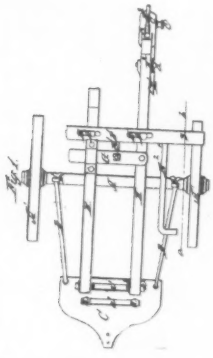
C. Attwood.

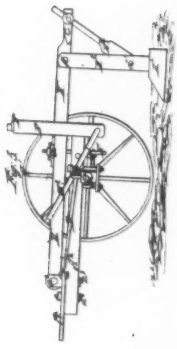
Gang Plow.

No. 54,087 Patented Apr. 24, 1866.



No.
Rowell et al
vs.
Lindsay et al
} p. 296.





Witnesses.
S. N. Randolph
A. Wagner

Inventor.
C. Attwood
by his attorneys
S. N. Randolph & Co.

Mr. Randolph, of St. Louis, is my patent agent, which you now. Ples rite by the returne maill, and a blige,

Yours, C. ATWOOD.

[Endorsed:] Patent Office, Apr. 25, 1866. 21st Feb., '66.

293 C. Atwood. Imp't in Gang Plown.

This invention consists in the peculiar arrangement of a metalic plate in front, by which the frame and beams are made ajustable, the manner of elevating and depressing the beams, and the manner of attaching the plow standards to the beams.

[Endorsed:] C. Atwood. Imp't gang plow. Brief of invention. 51–59.

294 1866.

No. 54089. 51–59.

C. Atwood, of Lebanon, county of St. Clair, State of Illinois.

Gang Plows.

Rec'd Jan'y 19, 1866.
Petition " " "
Affidavit " " "
Specification " " "
2 drawings " " "
Model Jan'y 2, 1866.
Cert. dep., $15, Jan'y 19, 1866.
Cash.
Add'l fee cert., $20, Ap'l 10, '66.
" " cash.
Examined Feb. 21, 1866, Brainerd.
2 issue, T. Harland, Feb'y 21, 1866.
3 patented April 24, 1866.
Recorded vol. 195, page 9.
Circular 1, Feb'y 23, '66.

M. RANDOLPH & CO.,
St. Louis, Mo.

1866.

295 1866. Improvement in Gang Plows. 1866.

Ex'd: L. M. M. V.

(Here follows diagram, marked p. 296.)

298 UNITED STATES PATENT OFFICE.

JOHN H. THOMAS and JOSEPH W. THOMAS, of Springfield, Ohio.

Improvement in Seeding-Machines.

Specification forming part of letters patent No. 152,706, dated June 30, 1874; application filed April 8, 1874.

To all whom it may concern:

Be it known that we, John H. Thomas and Joseph W. Thomas, of

Springfield, in the county of Clarke and State of Ohio, have invented a new and useful improvement in seeding-machines; and we do hereby declare that the following is a specification of the same.

This invention relates to the drag-bars and shovel-standards of broadcast seeders, and consists mainly in the manner of attaching the standards to the drag-bars.

In the annexed drawings, figure I is a perspective view of a drag-bar. Fig. II is an elevation of the same, partly in section.

The same letters in both figures indicate identical parts.

A is a wooden bar, having a hole bored through it at A^1, to receive a round rod attached to the frame of the machine. In order to maintain drag-bars of this construction at their proper spaces apart, we attach the braces B B on each side, extending so far as may be necessary, and attached in like manner to the round rod. The bar A is also cut so as to leave a slit in the rear end, as at A^2, to receive the shank of the shovels C. These are forged to the form clearly shown in the drawings, and secured in the slit by the bolt D. Another threaded bolt, E, is passed through the bar A, as shown, in such place as to sustain the shovel when in proper position. The ends of the bifurcated bar are then drawn down by the bolt E, or by the united action of the bolts E and D, until clamped against the standard of the shovel with such force that the friction shall maintain the shovel in position while passing through mellow earth, but not so tight but that it will yield to an excessive resistance before force enough is applied to break the shovel.

We are aware that bifurcated wooden drag-bars have heretofore been clamped on the head of the standard for this purpose; but a much greater force must be applied to prevent it from turning on a center than is required with equal surface to prevent the standard from sliding endwise through the gripe.

By the form given to the standard we obtain not only the gripe on the pivoted end, but also a gripe against the sides of the standard, so that from its form it must be moved in the direction of its length; a much less restraining force will then hold the standard with requisite tenacity.

We are aware, however, that the principle of so applying the gripe on cultivator teeth as that the friction shall act on a part drawn lengthwise has been heretofore utilized in the case of cultivator teeth having a curved arm attached to the standard, which extended between surfaces, by which it could be griped. Our device has its distinguishing feature in that construction, as shown, by which the shank is itself so bent as to give effect to the double action of the joint at the eye and the compressing-bolt E. By making it in one piece, its construction is greatly cheapened, as compared with that class when an arm has to be welded onto the shank.

What we claim as our invention, and desire to secure by letters patent, is—

In combination with the drag-bar A, bifurcated at A^2, the curved shovel-standard C, bent as shown, and pivoted by a bolt at D, and clamped by bolt E, substantially as shown and described.

J. H. & J. W. THOMAS.

Seeding-Machines.

No. 152,706. Patented June 30, 1874.

Fig. 1.

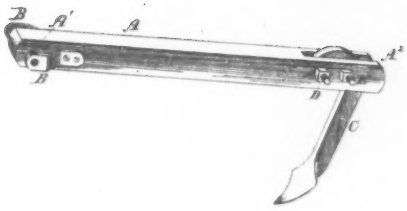
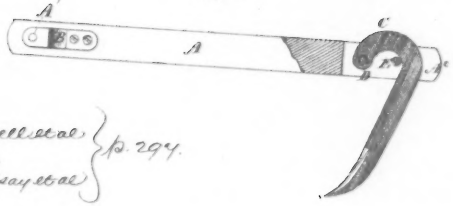


Fig. 2.



No.
Powell et al
vs.
Lindsay et al
} p. 294.

Witnesses.
A. Pappert
Edw. J. Gils

Inventor.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN H. THOMAS.
JOSEPH W. THOMAS.

Witnesses:
A. P. LINN COCHRAN.
JAS. S. BOGLE.

(Here follows diagram, marked p. 297.)

299 *Decree Dismissing Bill.*

And now, at this same term, to wit, January term, 1881, and on the fifty-seventh day thereof, to wit, on the 23rd day of March, A. D. 1881, the following proceedings were had, to wit:

JOHN S. ROWELL & IRA ROWELL
vs.
EDMUND J. LINDSAY & WILLIAM LINDSAY. } In Equity.

This day came the parties, by their counsel, and this cause having been heretofore argued upon the pleadings and proofs, on consideration thereof it is ordered, adjudged, and decreed by the court that the complainants' bill of complaint be, and hereby is, dismissed, and that the said complainants pay the costs in this cause to be taxed within ten days, or, in default thereof, that execution be issued for the same.

By the court: CHAS. E. DYER, *Judge.*

Appeal.

August 24, 1881. This day came the complainants, by their counsel, and prayed an appeal to the Supreme Court of the United States, and filed their bond with George B. Congdon and E. C. McFetridge, as sureties, in the penalty of one thousand dollars, conditioned
300 to prosecute and appeal to effect, and pay all costs and damages that may be awarded against them, if they fail to make their plea good, which bond is approved by the district judge, and is as follows:

Appeal Bond.

Circuit Court of the United States for the Eastern District of Wisconsin. In Equity.

JOHN S. ROWELL and IRA ROWELL, Appellants,
vs.
EDMUND J. LINDSAY and WILLIAM LINDSAY, Respondents.

Know all men by these presents that we, John S. Rowell and Ira Rowell, of Beaver Dam, Wisconsin, as principals, and George B. Congdon and E. C. McFetridge, all of the city of Beaver Dam, Dodge county, Wisconsin, as sureties, are held and firmly bound unto the said respondents, Edmund J. Lindsay and William Lindsay, of the city of Milwaukee, State of Wisconsin, in the sum of one thousand

dollars, to be paid to the said Edmund J. Lindsay and William Lindsay, their certain attorney, executors, administrators, or assigns, to which payment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, and each of us, jointly
301 and severally, and our, and each of our, heirs, executors, and administrators, firmly by these presents.

Sealed with our seals, and dated this 17th day of August, A. D. 1881.

Whereas the above-named John S. Rowell and Ira Rowell hath taken an appeal to the Supreme Court of the United States to reverse the decree rendered in the above-entitled action by the circuit court of the United States for the eastern district of Wisconsin, at the city of Milwaukee, Wisconsin, against the said John S. Rowell and Ira Rowell, and in favor of the said Edmund J. Lindsay and William Lindsay, in a suit brought by said John S. Rowell and Ira Rowell against said Edmund J. Lindsay and William Lindsay:

Now, therefore, the condition of this obligation is such that if the said John S. Rowell and Ira Rowell shall prosecute their said appeal to effect, and answer all costs and damages if they shall fail to make good their plea, then this obligation shall be void; otherwise to remain in full force and virtue.

JOHN S. ROWELL. [SEAL.]
IRA ROWELL. [SEAL.]
GEO. B. CONGDON. [SEAL.]
E. C. McFETRIDGE. [SEAL.]

Sealed and delivered in presence of—
J. E. HOSMER,
JAMES J. DICK.

302 STATE OF WISCONSIN, } ss:
County of Dodge, }

George B. Congdon, being first duly sworn, deposes, states, and says: That he is one of the sureties and subscribers to the above and foregoing bond; that he is a resident and freeholder of the county of Dodge and State of Wisconsin, and that he is worth the sum of two thousand dollars over and above all his debts and liabilities in property within the State of Wisconsin not by law exempt from execution.

GEO. B. CONGDON.

Subscribed and sworn to before me, this 17th day of August, A. D. 1881.

[SEAL.]

J. E. HOSMER,
Notary Public, Dodge County, Wis.

STATE OF WISCONSIN, } ss:
County of Dodge, }

E. C. McFetridge, being first duly sworn, deposes, states, and says: That he is one of the sureties and subscribers to the above and foregoing bond; that he is a resident and freeholder of the county of

Dodge, and State of Wisconsin, and that he is worth the sum of two thousand dollars over and above all his debts and liabilities in property within the State of Wisconsin not by law exempt from execution.

E. C. McFETRIDGE.

Subscribed and sworn to before me, this 17th day of August, A. D. 1881.

[SEAL.] J. E. HOSMER,
Notary Public, Dodge County, Wis.

I hereby approve of the above bond as to the form thereof, and the sufficiency of the sureties therein named.

August 24, 1881.

CHAS. E. DYER, *Judge.*

Whereupon it is ordered by the court that said appeal be, and hereby is, allowed, and a citation issued.

303 UNITED STATES OF AMERICA, } *ss:*
Eastern District of Wisconsin, }

I, Edward Kurtz, clerk of the circuit court of the United States of America for the eastern district of Wisconsin, do hereby certify that I have compared the writings annexed to this certificate with their originals now on file and remaining of record in my office, and that they are true copies of such originals, and correct transcripts therefrom, being a transcript of the record and proceedings, except exhibits offered by defendants, numbered 2, 3, 7, 9, on page 123 of said transcript, and No. 12, on page 124 thereof, and the model exhibits in case of John S. Rowell *et al. vs.* Edmund J. Lindsay *et al.*

In testimony whereof, I have hereunto set my hand and duly affixed the seal of the said court, at the city of Milwaukee, in said district, this twelfth day of October, in the year of our Lord one thousand eight hundred and eighty-one, and of the Independence of the United States the 106th.

[SEAL.] EDWARD KURTZ, *Clerk.*

304 THE UNITED STATES OF AMERICA, *ss:*

[SEAL.] To Edmund J. Lindsay and William Lindsay, Greeting:

You are hereby cited and admonished to be and appear at a Supreme Court of the United States to be holden at Washington on the second Monday of October next, pursuant to an appeal in the circuit court of the United States for the eastern district of Wisconsin, wherein John S. Rowell and Ira Rowell are appellants and you are appellees, to show cause, if any there be, why the decree passed against the said John S. Rowell and Ira Rowell should not be reversed, and speedy justice should not be done to the parties in that behalf.

Witness the Honorable Charles E. Dyer, district judge of the

United States for the eastern district of Wisconsin, at the city of Milwaukee, in the said district, this 24th day of August, A. D. 1881, and of the Independence of the United States the 106th.

CHAS. E. DYER,
U. S. Judge.

We admit service of the above citation, this 26th day of September, A. D. 1881.

WOOD & BOYD,
Sol's for Def'ts.

Endorsed on cover: E. Wisconsin C. C. U. S. No. 132. John S. Rowell and Ira Rowell, appellants, *vs.* Edmund J. Lindsay and William Lindsay. Filed October 18, 1881.

112-917

FILED.
NOV 14 1884
JAMES H. McKENNEY,
CLERK.

IN THE

SUPREME COURT OF THE UNITED STATES,

OCTOBER TERM, 1884, No. 132.

JOHN S. ROWELL AND IRA ROWELL,
Appellants,

vs.

EDMUND J. LINDSAY AND WILLIAM LINDSAY,
Appellees.

IN EQUITY.

Appeal from the Circuit Court of the United States for the Eastern District of Wisconsin.

BRIEF FOR APPELLANTS.

JAMES J. DICK,
Of Counsel for Appellants.

CRAMER, AIKENS & CRAMER, PRINTERS, MILWAUKEE.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM—1884.

No. 132.

JOHN S. ROWELL and
IRA ROWELL,
Appellants,

vs.

EDMUND J. LINDSAY and
WILLIAM LINDSAY,
Appellees.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF WISCONSIN.

BRIEF FOR APPELLANTS.

APPELLANTS' STATEMENT OF THE CASE.

This is a suit in equity brought in the Court below by the present appellants, as complainants, against the present appellees, as defendants, for infringement upon Letters Patent for "A New and

To this answer a replication was filed by complainants, and proofs having been taken, the case was heard before his Honor, Judge Dyer, and a decree entered dismissing the bill of complaint.

Transcript Record, p. 233.

See opinion at the close of this brief.

Rowell and another *vs.* Lindsay and another, 6 Fed. Rept., 291.

The only question considered by the Court below was that of infringement.

ASSIGNMENT OF ERRORS.

THE COURT BELOW ERRED:

First—In deciding that the defendants did not infringe.

Second—In dismissing the bill.

Third—In that it did not find the patent sued upon, in all respects good and valid, the property of complainants and infringed by defendants, and grant the injunction, account and other relief prayed in the bill.

MATTERS NOT IN DISPUTE.

There is no question raised by defendants' answer as to the validity of complainants' Re issue Letters Patent.

Defendants admit they sold machines containing teeth and beams identically like the exhibit offered

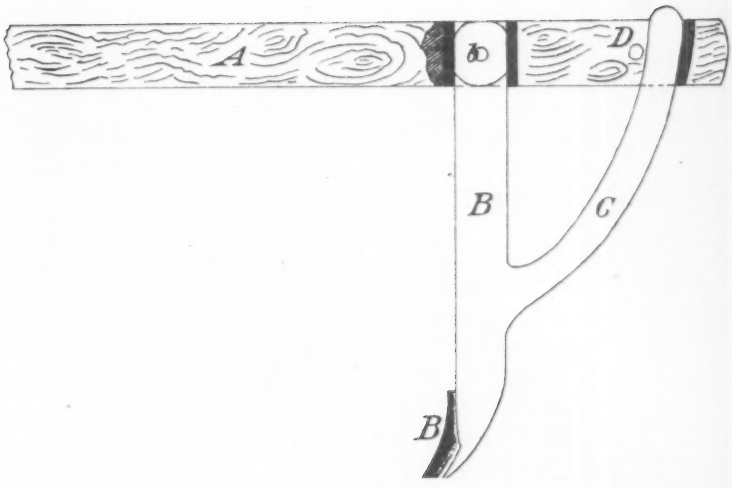
No. 2909

PHILADELPHIA BAR ASSOCIATION

J. S. and Ira Rowell

Cultivator

Fig. 1.



in evidence marked "Defendant's Tooth and Beam."

EXPLANATION OF THE RECORD.

On pages 15 to 75 inclusive, is the testimony for the complainants on the hearing of the issue raised by the bill, answer and replication; and on pages 76 to 212 inclusive, is the testimony for the defendants; and on pages 213–233 inclusive, are the patent "Exhibits" offered in evidence by the defendants.

ARGUMENT FOR APPELLANTS.

The Invention.

The nature of the invention is thus recited in the patent:

Figure 1 is a side elevation of the tooth, in a beam shown in a longitudinal section.

Figure 2 is a top view of the beam, with the tooth in position.

This invention consists in applying to the shank of the tooth a curved brace-bar, the upper end of which passes through a slot or mortise in the beam, and is held in position by a clamping-bolt, which passes transversely through the slot or mortise near the brace-bar, and forces the sides of the beam together against the brace-bar, so as to clamp it in any required position, and thereby adjust the tooth in any inclination, at the same time allowing it to yield to immovable obstacles without breaking.

In the drawings A represents one of the beams of a cultivator; B, the shank, pivoted at *b*; B', the tooth; C, a curved brace-bar, extending, in an arc of a circle, outward and upward from the rear side of shank B, and its upper end passing ver-

tically through a longitudinal slot or mortise, *a*, in the beam A; and D, a bolt, passing transversely through the slot or mortise, and having a head *d*, on one end, and a nut *d'*, on the other, by which the side-walls of the slot or mortise can be clamped against the brace-bar with any required force, thereby holding the latter in position when operating in the field.

It is evident that, in a device thus constructed and operating, the brace-bar C can be so clamped that the tooth will retain its position when working in arable soil, but will yield when coming in contact with an immovable obstacle, and pass over it without breaking, the shank turning back upon its pivot, *b*, and the brace-bar being forced up through the slot. The same arrangement also allows the shank to be adjusted in any position, for deep or shallow cultivating.

The device above described may be cheaply applied, is of very simple construction, and has been found more effective, practically, than other devices designed to operate in a similar way.

The claim is as follows:

What we claim as new, and desire to secure by letters patent, is:

The combination of the slotted beam A, shank B, brace-bar C, and bolt D, when the parts are constructed and arranged to operate as and for the purposes herein specified.

Transcript Record, pp. 16–17.

The slotted beam described embraces a wooden beam, as sufficiently appears from the specifications and drawings of the patent. The use of the words "slot or mortise" clearly indicates a wooden beam.

The drawings and specifications also clearly show that the complainants' device contains a pivoted bolt B.

It is also evident from the drawings, as well as from the language of specifications, what function the brace referred to

performs. The word is derived from a Latin word meaning an arm. The word brace, therefore, has reference to the functions of an arm. It might just as well be called an arm or an enlargement of the upper portion of the shank of the shovel—the object being to get the *leverage* at the proper distance from the pivotal point, whereby the pressure of the clamping bolt may be not nearly so great as otherwise—so that by means of this leverage the shovel is held to its work in the ground, when it would not be, with the same strength of material, providing that there was no arm of projection extending some little distance from this point, and it does not make any difference in any respect, as to form, provided we get a proper pressure to attain the leverage, to hold the shank in position for the shovel to perform its work in the field.

The model of complainant's tooth, and the tooth itself, introduced in evidence, is made in accordance with drawings and specifications of complainants' patent.

Transcript Record, pages 20, 21, 22, 33, 34.

In support of this construction of the patent, reference is made to the testimony of the following witnesses in Transcript Record:

John S. Rowell, 20.
Melville E. Dayton, 37, 38, 39, 42.
G. L. Chapin, 51, 52, 53, 65, 66.
Samuel Rowell, 32, 33.

The inventors have clearly established that the machines constructed under this patent were made with wooden beams.

The whole patent, the drawings, specifications, and models, and the words used, should be construed to carry out the manifest intention of the parties. The drawing is a part of a patent, and may be referred to, in order to help out the description, and for explanation of anything obscure. And letters patent are to be construed in the

light of the contemporaneous construction of the inventors.

And while the Court is governed by the claim, yet it is to be construed in favor of the inventor; and it is allowable to look at the detailed specifications, models and drawings, for the purpose of construing it; and it is not necessary that the specifications should describe such parts as practical use would at once suggest as necessary to make the machine efficient. And the machine or device has frequently a broader scope than the particular form of the machine designated.

Union Paper Co. *vs.* Nixon, 6 Fish, 602.
Blake *vs.* Rawson, 6 Fish, 74.
Hogg *vs.* Emerson, How., 606.
Marsh *vs.* Seymour, 7 Otto, 357.
Bates *vs.* Coe, 8 Otto, 38.
Walker on Patents, sec. 187.

We, therefore, say that unquestionably a fair and proper construction of complainants' patent shows clearly a *slotted wooden beam* and the *enlarging* of the *head* of the tooth for the purpose of retaining it in position.

The principal feature of the invention, then, is the *forming* of the *draft bar* as stated, by *slotting* out its rear point, and the *leverage* given to the device by extending or enlarging the upper portion of the shank of the tooth, whereby a large amount of resisting force is attained with a pivotal bolt.

It is claimed that the device patented is a new combination of the following elements, viz.: A slotted beam A, shank B, brace-bar C, and bolt D.

And that the slotted beam A, is a *new element* introduced for the purpose of holding cultivator teeth in combination with other parts, when working in tillable soil, and yielding when

coming in contact with an immovable obstacle without breaking.

That prior to complainant's invention the slotted wooden beam was not used or known for such purpose.

That at the date of such invention it was not known as a proper substitute for the older ways of holding such teeth.

That such slotted wooden beam performs entirely new, important and useful functions.

That the invention is new in the state of the art, so as to entitle them to protection.

The complainants claim that the defendants infringe the complainants' patent by selling machines using the same combination.

And by selling machines using the *slotted beam.*

A patentable combination may be one in which all the parts were known before, and where the sole merit of the invention consists in such an arrangement as to produce a new and useful result.

And a patentable combination may be one where some of the elements or parts of the combination are new and their invention is claimed, but where they are used in combination with parts or elements that were known before.

There is no infringement of a combination of the first kind, unless all the elements are used, but the second kind can be infringed by the use of a part, if it is new, and the invention of the patentee.

It is submitted that the complainants' combination contains such new element, that is, the *slotted wooden beam*, as used for the purposes designated.

A combination is patentable though it includes the same elements as a prior patent, if, in fact, the combination is new and useful and substantially different.

Fuller *vs.* Yentzer, 4 Otto, 297.

If an old ingredient performs some substantially new and different function, and was not known at the date of complainants' patent as a proper substitute, it would be patentable.

Rees *vs.* Gould, 6 Fish, 106.
King *vs.* Louisville Cement Co., 6 Fish, 336.
Seymour *vs.* Osborn, 11 Wall, 555.
The Collins Co. *vs.* Coes, 3 Fed. R., 227.

And if complainants' slotted beam should be considered an equivalent to some other device—yet if it was not known to ordinary mechanics as an equivalent, it is considered a new discovery, and patentable.

Woodward *vs.* Morrison, 5 Fish, 357.
Rees *vs.* Gould, 6 Fish, 106.

THE NEW ELEMENT.

NEW ELEMENT.

It is submitted that the slotted wooden beam A, used for the purposes designated in the complainants' combination, is a *new invention* in and of itself, for the reasons above given, as well as the following:

The slotted wooden beam was never, before complainants' invention, used for the purpose of holding cultivator teeth.

Transcript Record (complainants' record), p. 29.
Transcript Record (defendants' record), p. 132.

It was not known as a proper substitute for the older ways of holding such teeth. It was a new discovery. It was the use of wooden jaws for holding such teeth, in place of iron, or wood and iron combined, and in a form radically different from anything that preceded. The complainants have united in one part, viz., in the slotted wooden beam, a device for holding the tooth in position when at work as well as when at rest, and attaching it to the other parts of the machine, when, on all other prior machines, separate parts were used for

this purpose. The use of the slotted wooden beam affords a *continuous* clamping power, and performs a new function. The use of the slotted wooden beam allows the tooth to be placed in the center of the beam, which is very desirable.

Transcript Record (defendants' record), p. 137.

The tooth is held better for the uses designated by wooden jaws acting on iron teeth, than by former devices. It is true, that simply employing one known material in place of another, if the result be only greater cheapness and durability, is not patentable. But where some *new* and *useful* result —some new or different force or effect or result is obtained in the combined forces from that given by the separate parts—some new and useful result produced by the union of the parts, by a *change* of *material*, it is patentable. New and useful results are obtainable by the use of the *wooden slotted beam*. And a new and different force or effect is obtained by the use of the *slotted wooden beam*, in combination with the tooth, from that given by the separate parts. And that by the union of these parts a new and useful result is obtained.

Transcript Record, pages 31, 32.

Smith *vs.* Goodyear Dental Vulcanite Co., 3 Otto, 496.

Hicks *vs.* Kelsey, 18 Wall, 670.

Strauss *vs.* King, 2 Fed. R., 236.

Pearl *vs.* Appleton Co., 3 Fed. R., 160.

UTILITY.

Any degree of utility is sufficient to sustain a patent.

Conover *vs.* Roach, 4 Fish, 12.

The patent is evidence of utility.

Richardson *vs.* Lockwood, 6 Fish, 454.

The utility, and hence patentability, of complainants' invention seems to be demonstrated by the fact that its manufacture in large numbers was and is justified by the public recognition of its merits by demand and use.

Stuart *vs.* Shautz, 6 Fish, 35.

Robertson *vs.* Secomb, 6 Fish, 268.
Transcript Record, pages 17, 18, 34.

And when a device has gone into general use and displaced other devices previously employed for analogous purposes, it is an important element in the case to determine that it is a patentable invention.

Hotchkiss *vs.* Greenwood, 11 Howard, 248.
Pennsylvania Salt Co. *vs.* Thomas, 5 Fish, 148.
Smith *vs.* Conner, 6 Fish, 469.
Transcript Record, pages 17, 18, 34, 49, 50.

The defendants admit that complainants' device is patentable. (D. J. Powers' testimony.)

Transcript Record, page 123.

Superior utility is evidence that some new principle or mode of operation has been introduced.

Adams *et al. vs.* Edwards *et al.*, 1 Fish, 1.
Many *vs.* Sizer, 1 Fish, 17.
Furbush *vs.* Cook, 2 Fish, 672.

The complainants' device has been manufactured and used in large quantities. Such device, with the other devices that have pirated it, have gone into general use, and displaced others previously used.

Transcript Record, pages 17, 18, 34, 49, 51.
Strobridge *vs.* Lindsay, 2 Fed. R., 695.

NOVELTY, AS AFFECTED BY PRIOR PATENTS.

STATE OF THE ART.

Defendants allege that the patented invention of complainants is to be found in the following patents already in existence when their Letters Patent were granted. These, however, can be con-

sidered only as showing the state of the art, as no notice was given of them.

No. 7,241, granted L. Haverstick, April 2, 1850, for an improvement made in a grain-drill. No. 18,894, granted David Eberly, December 22, 1857, for an improvement in shovel-plows. No. 46,654, granted H. Francisco, March 7, 1865, for an improvement in cultivator-teeth. No. 47,008, granted Fowler & Bacon, March 28, 1865, for hanging cultivators. No. 51,768, granted Whiting & Mapes, December 29, 1865, for an improved grain-drill. No. 54,089, granted to C. Atwood, April 24, 1866, for improvement in gang plows. No. 36,672, granted to John S. Rowell and Ira Rowell, October 14, 1862, marked "Exhibit Rowell Patent." No. 51,536, granted C. Atwood, December 19, 1865, marked "Exhibit Atwood, Patent No. 1."

And several exhibits were also submitted which will not be considered, as they were made after complainants' invention, and do not show the state of the art.

A brief examination of the prior patents and machines referred to, as anticipating complainants' invention, is submitted.

HAVERSTICK, No. 7,241.

Defendants compare this device with complainants' device, and claim that it shows same purpose—that the idea of yielding teeth was not new. (See Patent Transcript Record, pages 216, 217, 218.)

We claim that the Haverstick is radically different from the complainants' device. It has no slotted beam; there is no brace; it is wholly different in the principles of construction and operation from the complainants' patent; the clamping device is not of wood, and is wholly distinct from the wooden beams; it has none of the advantages of cheapness and simplicity of construction of that of the complainants. And

But admits it is not substantially the same, and that on the whole it is a different device. Transcript Record (defendants' testimony), pages 112, 113. Defendants' expert thinks that if a set screw was applied to the forward part of the brace, it would be like complainants', but *would change the construction of the device.* Transcript Record (defendants' testimony), pages 113–138. A set screw is not an equivalent of the clamping bolt. The object of the inventor was to provide means for the yielding of the tooth, and he has his own *peculiar* way of doing it. But the means are entirely different from those of the complainants, and are very defective. The mortise in the beam is not compressed by any clamping bolt, and does not act, therefore, like the complainants' device. The complainants' is more simple, cheaper, and more easy to manufacture. Transcript Record (defendants' testimony), page 133. This device has gone out of use, and the complainants' and other devices have taken its place. Transcript Record (defendants' testimony), page 134. It has no slotted beam for holding tooth by clamping—it simply holds tooth in position latterly. Transcript Record (defendants' testimony), page 132. The elements of complainants' invention are not present in this patent, and it therefore does not anticipate complainants' patent. Transcript Record (complainants' testimony), pages 41, 63, 64. The defendants admit that so far as this device is concerned, complainants' is patentable. Transcript Record (defendants' testimony), page 135.

FOWLER AND BACON, No. 47,008.

Defendants claim that this device differs from complainants' in having a different mechanical construction for securing the same purpose. (See Patent Transcript Record, pages 219, 220, 221.)

This device may exhibit some ingenuity, yet it is practically wholly inoperative. In this device there is no slotted wooden drag-bar performing the double function of draft-bar and clamp, and the clamping is done in a radically different manner from the manner in which the shovel standard is clamped in the complainants' device; there is no continuous clamp. Transcript Record (defendants' testimony),

pages 150, 151. It has not the elements of the complainants' device, and fails wholly to anticipate the complainants' patent by reason of the essential differences in construction and operation. Transcript Record (complainants' testimony), pages 40–57. In complainants' device the clamp is continuous; in this it is not. The defendants admit the two devices are dissimilar, and that this device is not as simple and perfect in its mode of operation as complainants' device. Transcript Record (defendants' testimony), page 151.

WHITING AND MAPES, No. 51,768.

The patentees say nothing of this device yielding to extraordinary pressure, and it is not calculated to act in this manner, but is calculated to set the teeth rigidly against any opposing strain it is likely to meet with. It is not a yielding tooth. It is held in position by an eccentric or cam, which acts as a wedge. The action has the tendency to open the mortise, instead of compressing the slot, as in the complainants' device. It has none of the characteristics of construction or operation of the complainants' device, before pointed out, and does not anticipate complainants' patent. Transcript Record (complainants' testimony), pages 40, 46, 61, 62, 63.

ATWOOD, No. 54,089.

The defendants claim that this device contains the same elements and combination as the complainants', and for the same purpose and object. (See Patent Transcript Record, pages 222, 223, 224, 227, 228, 229, 230.)

We deny all this and claim: That Atwood indicates in his specifications no purpose analogous to that which is presented in complainants' patent, namely, the yielding of the plow when it strikes an extraordinary resistance in the ground. He describes his device as being intended to secure *adjustment* of the plow as to its angle with the beam, in order to vary the depth of the furrow. He accomplishes this adjustment by means of a set screw, and when the adjustment is made, the parts are secured permanently by setting the set screw firmly against the brace. A

set screw in mechanics is a device adapted wholly to secure the parts firmly in their relative positions. The iron faces in contact are broadly in contact, and the set screw, to hold, will need be run up so as to *sink*, as all set screws do in a measure, in the surface of the bar. Atwood used the set screw because it imbeds itself to a certain extent in the iron surface. It operates somewhat as a pin. This indenting of small surfaces of iron into the surfaces of other pieces of iron which are to move is the great trouble in getting a uniform movement with iron surfaces. It is held by positive force. Where a set screw is turned up with a certain amount of pressure at various separate points along on an iron bar, at some points where the set screw comes in contact with the bar, it will require one-third more force to move the bar than that it will at other places, when the set screw is turned up with the same amount of pressure. This is owing to the imperfections of all mechanism, which passes through the hands of human agencies. Bars of iron are usually taken as they come from the rolling mill, and of course they are not perfect; instead of being smooth, they are quite rough, as compared with machinery bearings, and for that reason it becomes necessary to have a yielding clamp to bear upon the shank of the cultivator tooth, in order if there be, and there always is, considerable inequality in the thickness of the bars of iron used, that they may not come in contact with so stubborn a resistance in the clamping as to move with such little, or with such great force, that it cannot be reasonably comprehended with what force to turn the screw to secure the cultivator tooth. Defendant does not claim a set-screw to be the same as a clamping bolt. Transcript Record, 151. In order to make seeding machines at such a price that farmers can afford to purchase them, it is necessary to arrive at some system of construction which will avoid the use of the planing machine, as all work done by such machines is too expensive. The complainants have obviated these objections as to the use of the set-screw, by the use of the wooden beam, the peculiar functions of which has been pointed out. A set-screw is in no sense, therefore, an equivalent for complainants' slotted beam and clamping bolt. The wooden beams, from the peculiar

character of the material, is best calculated for what is termed rough machinery, in which class these devices may be placed. Transcript Record (complainants' testimony), pages 40, 41, 58, 59, 60, 61. When set-screws are used, to avoid embedment against metal surfaces which are to have motion, antifriction plates are usually interposed between the set screws and the moving surfaces of such large surface as compared with the moving bodies as will prevent any embedment of one part in the other. Transcript Record (complainants' testimony), page 61. It is evident that Atwood never intended to obtain a slipping movement to the tooth, and especially does this appear in the absence of any statement for such purpose, and in the presence of a statement that the parts are to be firmly secured, and in the presence of the device itself, wholly adapted to firmly secure the parts. Atwood has no continuous clamp, and cannot be adjusted in the manner of complainants' device. The Atwood device does not contain complainants' slotted wooden beam, with its distinguishing characteristics, and consequently does not possess the destructive element of the complainants' invention. It does not, therefore, contain his combination. The defendants admit that so far as the Atwood patent is concerned, complainants' device is patentable. Transcript Record (defendants' testimony), page 179. This device has gone out of use. Transcript Record (defendants' testimony), page 210. It is not as simple and cheap to manufacture as complainants' device. Transcript Record (defendants' testimony), page 144. *Atwood has obtained two patents*, the first one being No. 51,536, dated Dec. 19, 1865. His petition is dated Dec. 22, 1864, and filed Dec. 31, 1864. This contains nothing whatever about slipping teeth. Patent file, wrapper and contents. The other one being No. 54,089, dated April 24, 1866; petition dated Dec. 4, 1865, and filed Jan. 19, 1866. This patent contains nothing whatever about slipping teeth. Patent file, wrapper and contents. See former discussion. Atwood states that his first patent, No. 51,536, was defective, in that when the plow met an obstruction it would break. That in the spring of 1865 he got up the cast iron device referred to in his second patent, No. 54,089, to avoid this

trouble, and made a model and sent them to Washington for a patent. (His petition bears date December 4, 1865.) Transcript Record (defendants' testimony), pages 210, 211. His specifications and patent are entirely silent as to this. Patent file, wrapper and contents. His claim of slipping must be an after thought. But complainants made and put in practical operation their device the last of 1864, or the very first days of 1865, building one like model No. 3, and in January and February they built and delivered sixty of the machines like plaintiffs' device, marked "plaintiffs' teeth and beam," the one on which suit is brought. Transcript Record (complainants' testimony), page 50.

Proof may be received by parol as to date of invention. Parker *vs.* Halme, 1 Fish, 44. Dane *vs.* Chi. Manf'g Co., 6 Fish, 130. Eagleton Manf'g Co. *vs.* West, Bradley & Cary Manf'g Co., 2 Fed. R., 224.

ROWELL RE-ISSUE, NO. 3,373, DATED APRIL 13, 1869.

Defendants' claim that this device is very like the complainants' device. They admit that there is no change in the form of the tooth in the Re-issue. Transcript Record (defendants' testimony), page 139. Transcript Record (complainants' testimony), page 50.

In this re-issue there is shown a slip tooth which belongs to the older art of such devices. The same general result of slipping may be attained, but in a much less degree and by means widely different. The continuous clamp is wanting in this device. It was a rigid tooth if drawn tightly. Clamping with iron is so sensitive that the least draw on the machine will wrench the parts, and the complainants' device is cheaper and less complicated. This device may have been very superior in its day, and performed a very useful purpose. But the complainants' device is very superior in its uniform operation to the one in this re-issue patent, for the reason before given. It is certainly cheaper, simpler and every way better adapted for the purpose, and is a long step in the art towards improving this useful instrument. The re-issue has not the adjustability of the device sued on, which is a marked improvement in the com-

plainants' device ; the re-issue device was very objectionable, in the fact, that when striking an obstruction the tooth was entirely thrown out of place, and was not easily re-adjusted. The re-issue device differs essentially from the complainants' device, in that, as already explained of the others, it does not contain the distinctively new element of the slotted wooden beam, in combination with an armed tooth and a clamping bolt operating to hold said armed tooth yieldingly within the slot, with all the distinguishing characteristics of such slotted wooden beam as heretofore fully pointed out. The slotted iron brace of this device is entirely different from a slotted beam made like the drawings and specifications of complainants' patent, and is entirely different in construction and operation. Transcript Record (complainants' testimony), pages 41, 56.

This re-issue has one element, while the patent sued on has three—slipping, adjustability and continuous yielding wooden clamp.

It does not, therefore, anticipate the patent sued on. The defendants' expert admits that one device would not be an infringement of the other. Transcript Record (defendants' testimony), page 139.

The defendants have introduced in evidence two devices upon the question of novelty, to-wit, "Bevel Square" and 'Dividers."

BEVEL SQUARE.

Defendants refer to bevel square as a slotted wooden beam.

There is no similarity of purpose or function, or community of combination of elements, between this as a whole and complainants' device. The bevel square is not a seeder shovel or drag bar. Complainants claim these elements only in combination with the shovel standard and beam for the purpose of a slipping cultivator tooth. Transcript Record (complainants' testimony), page 44. A piece of wood, slotted at the

end, with two holes bored in it, like the beam of complainants, would of itself suggest nothing. The same can be said of the bevel square. It was the combining of this new element of the slotted beam with others, as complainant has done, that rendered it effective, and this involved invention. The slotted wooden beam was not used, before complainants' discovery, for the purpose of holding cultivator teeth, as claimed by complainants, and was not known as a proper substitute for such purpose. Transcript Record (complainants' testimony), page 29; Transcript Record (defendants' testimony), page 132

DIVIDERS.

Defendants also refer to the dividers, where the set screw has long been used for holding in position.

There is no community of purpose nor community of combination of elements between these dividers and complainants' device, and the same remarks can be made as above in the case of the bevel square as to this exhibit. A set screw is not an equivalent of a clamping bolt, nor is it as good. Defendants' Record, page 152. Transcript Record (complainants' testimony), pages 44, 59, 61; Transcript Record (defendants' testimony), page 149. The difference between a set screw and complainants' clamping device has been before pointed out. It may be remarked that none of these machines offered by defendants in evidence would be an infringement of complainants' tooth, and therefore cannot be used in defense. Stainthor *et al. vs.* Elkinton, 1 Fish, 349. The court can make no use of a prior patent, introduced without notice, to show state of art, when the only object of such patent is to anticipate complainants' invention. Am. Saddle Co. *vs.* Hogg, 5 Fish, 353; Wallace *vs.* Holmes, 5 Fish, 37. And a suggestion in a prior patent claimed to embrace the patent must not be ambiguous, and such claim must be made before such invention. Graham *vs.* Morrison, 5 Fish, 1.

To briefly recapitulate some of the distinctive features of complainants' invention, in making the comparison with other devices:

There is nothing whatever found, prior to complainants'

patent, corresponding in construction or function with the complainants' slotted wooden beam, as used by them in combination with the other parts named, for the yielding support of the plow tooth. The slotted wooden beam is the novel element of the complainants' claim. The complainants' slotted wooden beam, as the jaws of a clamping device, in combination with the tooth, is not only simpler in construction, cheaper in cost, less liable to accident, less liable to get out of repair, but is also distinctive in its action, as a clamp holding yieldingly a flat iron shovel standard. The jaws are wholly of wood; they operate as springs to automatically release themselves from pressure upon the shovel standard, when not subjected to the action of the clamping bolt. They are brought up into contact with the shovel standard uniformly, and by reason of their texture being of wood, they conform readily to the inequalities of surface upon the standard. The ready conformity of the wooden surface of the jaws, permits the unequal surface of the standard to slide between the compressed jaws of the clamp, under the extraordinary strain to what it is desirable the clamp shall yield. There is consequently obtained, in a clamp constituted of wooden jaws, held by a clamping bolt like complainants', a *determinateness, uniformity and reliability* of action peculiar to itself, as distinguished from a clamp, both or one of whose jaws are of iron. The slotted wooden beam of complainants has this further distinguishing characteristic, that a single indispensable part of their machine, namely, the beam, by simply slotting it, is transformed into something more than a beam. It is now made a clamp by the aid of a clamping bolt, without the addition of any new part, and the expense and trouble of attaching it to another. Another feature of great importance is its adjustability; the spring clamp is adapted to automatically open when the force is overcome, so that without trouble the tooth may be shifted by the hand, or by a kick from the foot readily restored to its original or any desired position. And a given impression of the wooden jaws on the irregular surface of the shovel standard will give to-day, to-morrow and next week, a substantially uniform resisting power to the

friction of such clamp. A man in the field with a hand wrench, would to all intents and purposes, be able to give a uniform resistance to the clamp. This would not be the case with an iron clamp unless made with the utmost care, and the nicest measure of power applied to the clamp in order to secure anything like a uniform resisting effect. In order to use iron for this purpose, it would be necessary to carefully prepare both the inner surfaces of the jaw and the outer surfaces to the tooth, and even when thus prepared it would not have the desired holding and yielding qualities that belong to wood, by reason of its yielding fibrous structure. The use of iron, or part iron and part wood, in place of wooden jaws would be a very defective arrangement, unfit for a practical, cheap and useful machine. Complainants' invention consists of the slotted beam, and in the use of this they have taken a long forward step in simplifying the slip tooth, rendering it more certain in its operation, less liable to get out of order, very much cheaper in construction, and in every way a superior agricultural implement to any that has been before produced, wood being the very best material in use for the drag-bars.

The complainants' patent is evidence of novelty, and the burden of proof is on the defendants to show the complainants are not the first inventors. Graham *vs.* Mason, 5 Fish, 1. Richardson *vs.* Lockwood, 6 Fish, 454. The complainants' device, in its construction and operation, is a great advance, *at least* in the state of the art to which it appertains, promoting a more useful function than was before available. Transcript Record (complainants' testimony), pages 18, 19, 20, 39, 47, 52, 53, 66. *Invention* means the finding out, the contriving, the creating of something that did not exist, and was not known before for the purpose designated, and which can be made useful. Conover *vs.* Roach, 4 Fish, 13. If it is a better invention than before known, and a new principle of operation has been introduced, it is patentable. The complainants are the first inventors. Transcript Record (complainants' testimony), pages 23–29 Seymour *vs.* Marsh, 6 Fish, 115. Rich *vs.* Lippencott, 2 Fish, 1.

These several devices produced by defendants as anticipating

complainants' invention, and sought now to be used in a way in which they were never designed to be used, and in a way that they really were not used; and no person looking at them would understand that they were to be used in the way complainants' was used, and it is not shown that they really were used or operated in the way that complainants' invention is used and operated.

Clough *vs.* Barker, 16 Otto, 107.

INFRINGEMENT.

The only question considered by the Court below was that of infringement, which question, it is submitted, is the material one in this case.

The complainants' patent is a re-issue. A certified copy thereof, marked "Exhibit A," is in evidence, being letters patent No. 2,909, re-issue, complainants, patentees, dated March 31, 1868, with the drawings and specifications attached thereto. (Transcript Record, pages 15, 16, 17.) Complainants' device offered in evidence and marked "Plaintiff's tooth and beam." (Transcript Record, page 20). Defendant's device, claimed as infringing, in evidence, and marked "Defendant's tooth and beam." (Transcript Record, page 19). Models of these devices in evidence, and marked respectively "Exhibits No. 1 and No. 2." (Transcript Record, page 22). Model offered in evidence, of the first tooth made by complainants on principle of slotted beam, and marked "Exhibit No. 3." (Transcript Record, page 22). Certified copy of the patent of John H. Thomas and Joseph W. Thomas, No. 152,706, dated June 30, 1874, under which the defendants herein justify. The following are the letters patent referred to :

UNITED STATES PATENT OFFICE.

JOHN H. THOMAS AND JOSEPH W. THOMAS, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN SEEDING MACHINES.

Specification forming part of Letters Patent No. 152,706.
Dated June 30, 1874. Application filed
April 8, 1874.

To whom it may concern:

Be it known that we, John H. Thomas and Joseph W. Thomas, of Springfield, in the County of Clarke, and State of Ohio, have invented a new and useful improvement in seeding machines; and we do hereby declare that the following is a specification of the same:

This invention relates to the drag-bars and shovel standards of broad-cast seeders, and consists mainly in the manner of attaching the standards to the drag-bars.

In the annexed drawings, figure 1 is a perspective view of a drag-bar; figure 2 is an elevation of the same, partly in section. The same letters in both figures indicate identical parts.

A is a wooden bar, having a hole bored through it at A1, to receive a round rod attached to the frame of the machine. In order to maintain drag-bars of this construction at their proper spaces apart, we attach the braces BB on each side, extending so far as may be necessary, and attached in like manner to the round rod. The bar A is also cut so as to leave a slit in the rear end, as at A2, to receive the shank of the shovels, C. These are forged to the form clearly shown in the drawings, and secured in the slit by the bolt D. Another threaded bolt, E, is passed through the bar A, as shown, in such place as to sustain the shovel when in proper position. The ends of the bifurcated bar are then drawn down by the bolt E, or by the united action of the bolts E and D, until clamped against the standard of the shovel with such force that the friction shall maintain the shovel in position while passing through mellow earth, but not so tight but

J. H. & J. W. THOMAS.

Seeding-Machines.

No. 152,706 Patented June 30, 1874.

Fig. 1.

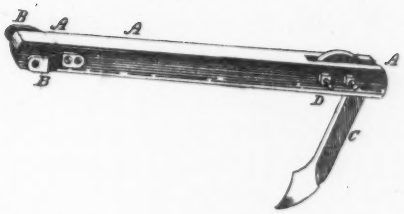
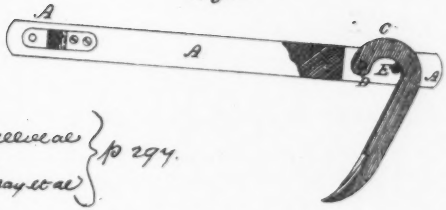


Fig. 2.



No.
Powell et al
vs.
Lindsay et al
} p 294.

Witnesses.
A. Ruppert
Chas. J. Eils

John H. Thomas
Jos. W. Thomas
Inventor.
D. P. Holloway & Co
Attys

The defendants admit that they have sold seeding machines and cultivators made by Thomas, Ludlow & Rogers, of Springfield, Ohio, by authority under letters patent No. 152,706, granted J. H. and J. W. Thomas, June 30, 1874, and they have put a certified copy of such letters in evidence. (Transcript Record, page 23). It seems that the defendants are the agents of Thomas, Ludlow & Rogers, and that Thomas, Ludlow & Rogers are defending for the defendants. Transcript Record (defendant's testimony), pages 98–186.

The defendants deny that such machines infringe complainants' patent. And claim that the combinations of the two devices are not alike; that the complainants' device has no pivotal bolt, while the defendants' has one; that the defendants' device has no brace, while the complainants' has one; that the complainants' tooth is held by the clamping of the brace, and the defendants' by the clamping of the shank of the tooth; that their tooth performs substantially a different function from that of the complainants' by virtue of the form of the tooth in passing over obstructions, their tooth moving over the surface of the beam in a circle—the complainants' through endwise. That their bolt bends in the shank, and that complainants' does not, on account of having a brace. That the strain of their tooth is on the shank, and in the complainants' on the brace. That their tooth is the most durable, on account of the manner of passing through the beam. That on account of having no brace it does not gather rubbish. That their tooth can be aligned.

We deny all these claims, and insist that the combinations of the two machines are the same; that the two devices perform substantially the same office, and in substantially the same way.

The defendants' patent and model exhibit contains all the elements of complainants', without exception. The two devices are constructed and arranged to operate substiantially for the same purpose, and in the same manner. The same parts are present in each device, namely, the slotted wooden beam, the shovel shank, brace bar or arm, and a clamping bolt; the shank of the tooth in both cases is similarly loosely

pivoted within the slot, and similarly clamped by means of the clamping bolt. Transcript Record (complainants' testimony), page 42.

The complainants' have sought to get a leverage some distance from the pivotal point, whereby the pressure of the clamping bolt may be not nearly so great as otherwise, so that by means of this leverage the shovel is held to its work in the ground when it would not be with the same strength of material, providing there was no arm of projection extending some little distance from this point. It is plain to see from the language of the specifications, what function the brace referred to performs. The word is derived from a Latin word, meaning an arm. The word brace, therefore, has reference to the functions of an arm, or an enlargement of the upper portion of the shank of the shovel, the object being to get the leverage at the proper distance from a pivotal point, and it makes very little difference in any respect as to form, provided we get a proper pressure to attain the leverage, to hold the shank in position for the shovel to perform its work in the field. Transcript Record (complainants' testimony), pages 20, 35, 36, 42, 43, 52, 53, 67.

The principal feature of the invention is the forming of the draft bar, as stated, by slotting out its rear part, and the *leverage* given to the device by *extending* or *enlarging* the upper portion of the shank of the tooth, whereby a large amount of resisting force is attained. Transcript Record (complainants' testimony), pages 52, 53, 67.

There is unquestionably at the top of the plow standard in defendants' patent and model exhibit, an *arm extending from said standard, lying within the slot*, at a point somewhat distant from the center of motion of the standard, and there is a clamping bolt which compresses the jaws formed by the slot upon such arm. It is immaterial at which end of the arm the standard is joined, or at which end of the arm the clamping bolt is applied. The transposition of the clamping and pivoting bolts in the defendants' device would not materially affect the operation, principle or construction of such device. In both cases would the clamping bolt operate equally upon the arm rigidly

secured to the standard, at a sufficient distance from the pivotal point to give the required leverage to sustain the standard when exposed to extraordinary strain. Such a modification would be such as any ordinary mechanic might readily make, without invention. Transcript Record (complainants' testimony), pages 42, 65, 66, 67, 68. See Dayton models, Transcript Record, page 43.

There is clearly a brace in the defendants' patent, because there is leverage, and there cannot exist leverage without there is connected a brace in some form. The object of complainants was, not to make a brace simply to brace their tooth—this is apparent from the function of what he calls "brace"—but simply to enlarge the metal; extend out something from the shank in some direction, in some form, to get a frictional power, some little distance from the pivotal point, that is, to get a leverage there, that they might hold the shovel standard in position to till tillable soil. The method of clamping of these two devices is the same precisely, and all the benefits to be derived by the yielding surface of wood are equally found in both.

The brace in complainants' device is for the purpose of obtaining leverage, to save the enlargement of the head, or the making of a heavy shank, as well as for the purpose of aligning the tooth, from time to time, as it becomes worn forward or backward; and the fact that it does strengthen the shank is only a mechanical result.

The complainants first utilized the *open slotted beam* for the purpose of giving the proper friction upon the shovel standard. Transcript Record, pages 29–50, 132.

The complainants are also the inventors, so far as anything in the record is concerned, of the enlargement of the upper end, to get a leverage some distance from the pivotal bolt. The distinction in the form of the upper end of brace, or enlargement of the shovel standard, in order to get a leverage at a certain distance from the pivotal point of the shank, is wholly and absolutely immaterial. In the defendants' device, the upper portion of the standard is made somewhat semi-circularly, and the pivotal bolt instead of passing through the main standard, as in the complainants', passes through the end of

the semi-circular part, and the clamping bolt passes through the jaws of the clamp near the main portion of the shovel standard. But the same result is attained by the same slot in the draft-bar, by a shovel standard having an enlargement at the upper end, to give a leverage. And in meeting an obstruction, the shovel standard would swing back on its pivot in the same manner, and be resisted by the same frictional force exerted in the same manner, in both devices. An ordinary farm-hand would carry the same wrench using the defendants' device, that he would using the complainants', and he could not possibly notice any difference in the power required to hold defendants' or complainants' device. Transcript Record, pages 42, 43, 56, 58, 59, 65, 66, 67, 68.

The pressure of the teeth of the two devices are both downward during the backward movement of the shank of the tooth. Transcript Record, pages 46, 65, 66.

The testimony of the complainants' experts would seem to be conclusive on the question of the substantial identity of the two devices. The result is the same in kind, and it is not necessary to be the same in degree to constitute infringement. Whipple *vs.* Middlesex Co., 4 Fish, 41.

The claim made by defendants, that they can align their tooth, by means of the bolt, is clearly unauthorized, for the reason that when the tooth is new, it should stand in a certain position, for the purpose of entering the ground a suitable depth suitable for cultivating, and if then placed against the bolt, after the tooth becomes worn, it should be readjusted forward, to retain its proper depth in the ground, which they are unable to do with their device. This claim is evidently an after thought, as they make no such claim in their patent. The complainants can align their tooth to all positions, and make such claims in the specifications of their patent.

Although further argument seems unnecessary, we remark:

That the construction of the two devices is the same. Defendants' device has a brace; complainants' has a pivotal bolt; the other points are not disputed. They have, therefore, the same number of elements.

Defendants argue that they can dispense with the pivotal

bolt, and still have a practical machine. The complainants can do so as readily. The difference in holding would be only in degree. To remove the pivotal bolt would be to change the construction and operation of defendants' device. The pivotal bolt is useful and important to retain the tooth fast to the machine. Transcript Record (defendants' testimony), pages 189, 190, 191. If complainants' brace should be curved over and meet, it would not affect its operation. Transcript Record (defendants' testimony), page 124. The complainants first made such a tooth. Transcript Record (complainants' testimony), pages 25–33. The complainants may put their brace in front or back of the shank of the tooth. Transcript Record (defendants' testimony), page 135. The conclusive argument that defendants' tooth has a brace, is that if the curved portion was cut off, the tooth would not be properly held in the slotted beam. But with the addition of the curve it is held in position. The curve prevents the tooth from being pushed up through the slotted beam—it retards, holds it down, and gives it additional strength. The two teeth perform substantially th same function in passing over obstructions, and move over substantially the same surface, in substantially the same way in slipping back. The defendants admit that the action at work is the same. Transcript Record (defendants' testimony), page 149.

They claim that the only manner in which the operation of the two teeth is different, is in passing over surfaces differently, complainants' slipping up longitudinally, defendants' in a more sweeping direction. Transcript Record (defendants' testimony), page 128. But an inspection of the devices will show that the teeth pass over substantially the same surface. The only difference, if any, is in degree. Complainants' device can easily be made to pass over more surface by enlarging the brace. Complainants' tooth will hold for all practical purposes. Any form that will give surface for friction is all that is necessary, and form is of no importance. Transcript Record (defendants' testimony), page 154. Transcript Record (complainants' testimony), page 65.

The defendants admit that the difference of the devices

is in durability and wear more than in mode of operation. Transcript Record (defendants' testimony), page 149.

The open slotted beam is clamped by the same kind of pressure in both devices. Defendants claim their pressure is applied to the tooth, and that complainants apply theirs to the brace, but the defendants' tooth clearly has a brace. (Transcript record, pages 42, 67, 68. Complainants' record, pages 12 and 22.) There is nothing in this position. The downward pressure in both is the same, and on the pivotal bolt. The claim of defendants that there is some pressure forward of clamping bolt by reason of the pivotal bolt, is an argument in favor of its acting as a brace. But complainants' can as readily be so used ; in fact, the exhibit of complainant's tooth and beam, introduced by defendants, contains a bolt, like defendants. If defendants' tooth bends in shank it is only an evidence of defective construction, and easily remedied by strengthening the shank. And for that matter the complainants' may bend. The strain on both teeth is substantially the same. The practical operation of the teeth is the same. Transcript Record (defendants' testimony), page 158. Do not wear out so as to impair the holding power. Transcript Record (defendants' testimony), pages 101-102. Complainants' device will not clog. The question of clogging is only a question of perfection of work.

The defendants refer to a device which they term a "T-headed tooth." And also to a device which they call defendants' "Modified tooth and beam." These devices are within the patent of complainants—although a very poor and defective form of tooth. Transcript Record (complainants' testimony), pages 45, 69, 70. They also call attention to a form of tooth like defendants', with the pivotal bolt removed, and a set screw used in placing it. We have before fully discussed the functions of a set screw, and find them radically different from the action of a clamping bolt.

The defendants' specifications were evidently drawn and their claim made with express reference to avoiding the claim of complainants. Transcript Record (defendants' testimony), pages 187, 197. We remark that where an idea is once suggested, and one made of utilizing it is pointed out, others are

easily adopted. Smith *vs.* Fay & Co., 6 Fish, 446. The great leading idea of complainants' patent is the slotted wooden beam with the enlarged head of the tooth to obtain leverage. And when a mechanic once has this idea firmly fixed in his mind, he can easily carry out the idea in a variety of forms. Potter *vs.* Schenck *et al.*, 3 Fish, 85. Loom Company *vs.* Higgins, 15 Otto, 591. Atlantic Works *vs.* Brady, 17 Otto, 200. The change made by the defendants is one that would be easily made by a mechanic seeking the vary form without varying substance, and hoping, while using the machine, to avoid the charge of infringement. Transcript Record, page 46.

But whether the construction is the same or not in the two devices, and whether the form of the teeth is equivalent or not, and whether the mode of operation is the same or not. Yet the defendants' have used the slotted wooden beam, the complainants' invention, for the purpose of holding slipping cultivator teeth.

The differences are merely formal and not substantial. Lake Shore, etc., R. R. Co. *vs.* Car Brake Shoe Co., 110 U. S. R., 237.

The following authorities are submitted as sustaining the claims of the complainant:

Infringement is a question of fact, and is best determined by the comparison of the machines. Fuller *vs.* Yentzer, 4 Otto, 288–297. Marsh *vs.* Seymour, 7 Otto, 349–358. Hudson *vs.* Draper, 4 Fish, 256–259. Morris *vs.* Burnett, 1 Fish, 401. Crompton *vs.* Belknap Mills, 3 Fish, 554.

A subordinate device is not within the rule as to the use of all the elements of a combination. Smith *vs.* Fay & Co., 6 Fish, 446.

The patentee is not confined to the precise form of his combination; if the substance be taken, although the form may be changed, it is an infringement. Case *vs.* Brown, 2 Fish, 268.

Although a patent may describe a particular form, yet unless the form and substance are inseparable, the patent

may cover any form. And where the whole substance of the invention may be copied in a different form, it is the duty of the Court to look through the form to the substance for that which the patent was designed to reach. Winans *vs.* Denmead, 15 How., 330–404. Buch *vs.* Hermance, 1 Blatch. C. C., 398-404. Parkhurst *vs.* Kinsman, 1 Blatch. C. C., 488–497. Blanchard *vs.* Beers, 2 Blatch., 411–418.

A mere change of form in the elementary parts of a combination, or in different parts of a machine, does not change the character or principle of the machine, provided the spirit, substance and principle of the machine is retained, and such formal change does not constitute a defense. Foss *vs.* Herbert, 2 Fish, 31. Conover *vs.* Roach, 4 Fish, 13.

If a device performs substantially the same office and in substantially the same way of another, it is an equivalent of such other. Conover *vs.* Roach, 4 Fish, 13. Conover *vs.* Rapp, 4 Fish, 57.

And a device is not less an equivalent of another because, in addition to all the functions of such other, it may perform a further office, or perform them better or more effectually. Wheeler *vs.* Clipper Mower and Reaper Co., 6 Fish, 1. Conover *vs.* Roach, 4 Fish, 13. Sarven *vs.* Hall, 6 Fish, 495.

We, therefore find, in the defendants' patent, and in their model exhibit, each and every element of the complainants' claim.

The defendants, therefore, have infringed the complainants' patent, by selling machines containing their device.

JAMES J. DICK,
Of Counsel for Appellants.

OPINION.

CIRCUIT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF WISCONSIN.

ROWELL AND ANOTHER
vs.
LINDSAY AND ANOTHER.

6 Fed. Rept., 291.

DYER, D. J.

This is a bill to restrain the infringement of a patent for an alleged new and useful improvement in cultivators. The original patent was issued to complainants July 3, 1866. A re-issue was granted March 31, 1868. Various defences are interposed, among which is the defence that defendants are selling cultivators made by Thomas, Ludlow & Rodgers, of Springfield, Ohio, which are covered by letters patent No. 152,706, granted to J. H. & J. W. Thomas, June 30, 1874, and they deny that they are infringing complainants' patent. In the specifications of the patent, the invention is described as consisting of the application to the shank, B, of the tooth, of a curved brace-bar, C, the upper end of which passes through a slot or mortise in the beam, A, and is held in position by a clamping bolt, D, which passes transversely through the slot or mortise near the brace-bar, so as to clamp it in any required position, and thereby adjust the tooth in any inclination, at the same time allowing it to yield to immovable obstacles without breaking. It is further stated in the specifications that "it is evident that in a device thus constructed and operating, the brace-bar, C, can be so clamped that the tooth will retain its position when working in arable soil, but will yield when coming in contact with an immovable obstacle, and pass over it without breaking; the shank turning back upon its pivot, and the brace-bar being forced up through the slot."

The invention being thus described, what is claimed as new and desired to be secured by letters patent is the "combination of the slotted beam, A, shank, B, brace-bar, C, and bolt, D, when the parts are constructed and arranged to operate as and for the purpose herein specified."

The device patented to J. H. & J. W. Thomas, and which the defendants are selling, consists of a wooden bar or beam having a slit in the rear end to receive the shank of the shovel or tooth. The shank and the tooth consist of one piece of metal, the shank at its upper end being of curved form, and secured in the slit by a bolt or pivot. Another threaded bolt is passed through the beam or drag-bar, a little in the rear of the bolt to which the shank of the tooth is fastened, and in such place as to sustain the tooth or shovel when in proper position. It is stated in the specifications of the patent that the ends of the bifurcated bar or beam are drawn down by the threaded bolt which sustains the tooth or shovel when it is in position, or by the united action of both the bolts mentioned, "until clamped against the standard of the shovel with such force that the friction shall maintain the shovel in position while passing through mellow earth, but not so tight but that it will yield to an excessive resistance before force enough is applied to break the shovel." It is further stated that by making the shank in one piece its construction "is greatly cheapened as compared with that class where an arm has to be welded to the shank;" and the substance of the patentee's claim is, in combination with the drag-bar or beam, bifurcated at the rear end, the shovel standard, curved at its head and where it is adjusted to the drag-bar, and pivoted and clamped by the bolts before described.

The only question which it is necessary to consider is that of infringement. The complainants' patent is for a combination. It is a settled rule of law that where a patent is for a combination of known parts, it is not infringed by the use of any number of the parts less than the whole; for the patent in every such case is for that identical combination, and nothing else, and a combination of any less number of parts is a different thing. *Sharp vs. Tifft*, 2 Fed. Reps., 697. This principle has been so often reiterated that it is elementary. *Prouty vs. Ruggles*, 16 Pet., 336; *Lee vs. Blandy*, 2 Fish, 89; *Latta vs. Shawk*, 1 Fish, 465; *Gould vs. Rees*, 15 Wall, 187. There is, however, another class of combinations, where some of the parts are new and others old, and where the new parts are claimed as inventions. If the combination is of this character, the appropriation of

the part which is new is an infringement. *Latta vs. Shawk, supra; Lee vs. Blandy, supra; Sharp vs. Tifft, supra.* The complainants claim that their patent falls within the latter class. They insist that the slotted wooden beam used for the purpose designated in their combination is a new invention in and of itself, and that as defendants use such a beam they infringe. It may be, and in fact the testimony tends to establish, that a slotted wooden beam was not used before complainants' patent for holding cultivator teeth. But this is not enough to make it a new thing within the rule last above stated. As matter of fact, a beam containing a slot or mortise, such as that in the complainants' device, is old, and the most that can be rightfully claimed in that respect isthat an old and well-known part or thing is applied to a new use as part of a patented combination. Furthermore, the complainants do not in their specifications or claim allege that they are the inventors of the slotted beam, nor of anything less than the entire combination. And it is conclusively settled that where a patentee claims as his invention only the combination which he describes, the separate parts which constitute the combination are to be regarded as old, or common and public.

In *Rich vs. Close*, 4 Fish, 282, it was said, by Judge Woodruff, that "an inventor must be taken to know of what his invention consists, and his patent does not secure to him the exclusive right in anything more than he claims to have invented. * * * Here the patentee has narrowed his claim by the use of terms which are express and clear: 'What I claim as my invention, and desire to secure by letters patent, is the combination of the wheel, constructed as hereinbefore described, with the spiral conductor, D, and tube, F, so as to get the full pressure of the water while the wheel is relieved of its weight, in the manner and for the purpose set forth.' He does not claim to have invented either of these parts separately, nor to have invented a useful combination of any two of the parts without the third. He may have invented each of them, but he has not obtained a patent for either of them. We are, therefore, left to the assumption that each was old, and that his specific combination alone was new."

In *The Corn-planter Patent*, 23 Wall., 224, it was held that "where a patentee, after describing a machine, claims as his invention a certain combination of elements, or a certain device or part of the machine, this is an implied declaration, as conclusive, so far as that patent is concerned, as if it were expressed, that the specific combination or thing claimed is the only part which the patentee regards as new. True, he or some other person may have a distinct patent for the portions not covered by this; but that will speak for itself. *So far as the patent in question is concerned, the remaining parts are old, or common and public.*"

These statements of the law, as thus expressed in the two cases cited, are exactly applicable to the case at bar. Here, as in *Rich vs. Close*, the patentees have narrowed their claim by the use of clear and express terms: "What we claim as new, and desire to secure by letters patent, is the combination of the slotted beam, A, shank, B, brace-bar, C, and bolt, D, when the parts are constructed and arranged to operate as and for the purposes herein specified." Not having claimed to have invented either of the parts separately, and expressly claiming only a certain combination of parts as described, there is an implied declaration, as conclusive as if it were expressed, that the specific combination is the only part which the patentees regard as new, and that the several parts of the combination are old. Upon the highest authority, it therefore conclusively appears, I think, that complainants are not in a position to claim that their slotted beam was of itself a new invention or discovery. And, as before stated, it is not enough to say that it was not before used for holding cultivator teeth; for it cannot be reasonably claimed that the mere application of an old thing to a new use in a combination is such invention of a new part as would bring the case within that class of combinations where the appropriation of a single part is an infringement. But it is contended that the slotted beam is the distinctive and essential feature of complainants' invention, and should be regarded as such in passing on the question of infringement. The court must, however, look at the entire specifications and claims of the patentees, in determining what their invention is. The combination is an entirety. Unless

it is maintained as such the whole of the invention fails. If one of the elements is given up the thing claimed disappears. Where a patentee, suing for an infringement, declares upon a combination of elements which he asserts constitutes the novelty of his invention, he cannot abandon a part of such combination and maintain his claims to the rest. Much less can he prove any part of his combination immaterial or useless. *Vance vs. Campbell*, 1 Black., 427. The different parts may perform more or less important functions, but each and all are essential to make the thing which the patentee has claimed as his invention.

It follows, from what has been stated, that the defendants do not infringe the complainants' patent by merely using the slotted beam. They do not infringe unless they have appropriated the entire combination. The patentees declare in their specifications what their invention is. They expressly say, *inter alia*, that it consists "*in applying to the shank of the tooth a curved brace-bar*, the upper end of which passes through a slot or mortise in the beam." The defendants use the slotted beam, the shank of the tooth and the clamping bolt. But in their device there is no brace-bar welded to the shank, and passing up through the mortise in the beam. Both parties use the pivot which attaches the shank to the beam; but this pivot is not claimed by the complainants as part of their invention. As, therefore, the construction of the defendants' device does not include the curved brace-bar, if the case were to stop here it would seem that the patentees' entire combination is not appropriated, and so that there is no infringement. But it is insisted that the difference between the two devices is one merely of form, and that in fact all the elements of complainants' machine are present in that which the defendants are selling. There is no doubt of the right of the patentee to invoke the doctrine of equivalents on a question of infringement in the case of a combination patent. The law upon this subject is settled in *Conner vs. Roach*, 4 Fish, 12; *Seymour vs. Osborne*, 11 Wall., 516; and in *Gould vs. Rees*, 15 Wall., 187. In the case of *Seymour vs. Osborne*, the Court say that "mere formal alterations in a combination * * * are no defence to the charge

of infringement, and the withdrawal of one ingredient from the same, and the substitution of another which was well known at the date of the patent as a proper substitute for the one withdrawn, is a mere formal alteration of the combination, if the ingredient substituted performs substantially the same function as the one withdrawn." But the Court further say that to constitute infringement all the material ingredients of the prior combination must be appropriated, and the inventors of a new combination "cannot suppress subsequent improvements which are substantially different, whether the new improvements consist in a new combination of the same ingredients, or of the substitution of some newly discovered ingredient, or of some old one performing some new function not known at the date of the letters patent as a proper substitute for the ingredients withdrawn." And in *Gould vs. Rees* the Court say: "*Bona fide* inventors of a combination are as much entitled to equivalents as the inventors of other patentable improvements. * * * Apply that rule and it is clear that an alteration in a patented combination which merely substitutes another old ingredient for one of the ingredients in the patented combination, is an infringement of the patent, if the substitute performs the same functions and was well known at the date of the patent as a proper substitute for the omitted ingredient; but the rule is otherwise if the ingredient substituted was a new one, or performs a substantially different function, or was not known at the date of the plaintiffs' patent as a proper substitute for the one omitted from his patented combination. Where the defendant, in constructing his machine, omits entirely one of the ingredients of the plaintiffs' combination without substituting any other, he does not infringe; and if he substitutes another in place of the one omitted, which is new, or which performs a substantially different function, or if it is old, but was not known at the date of the plaintiffs' patent as a proper substitute for the omitted ingredient, then he does not infringe." See, also, *Gill vs. Wells*, 22 Wall., 1. It follows, therefore, from these statements of the law, that if the defendants omit entirely one of the elements of complainants' combination without substituting any other, or if they substitute another which is new,

or which performs a substantially different function, or if it is one that is old but was not known at the date of complainants' patent as a proper substitute for the omitted ingredient, or if their machine consists in a new combination of the same ingredients, then the defendants do not infringe. A material ingredient of complainants' device is the curved brace-bar welded to the shank of the tooth. This cannot be denied. If the defendants, omitting the brace-bar, have substituted an element in its place, that substitution consists not in supplying by physical addition another part, distinct from the rest of the device, in the place of that omitted, but in merely changing the form of the head of the shank where it rests in the mortise in the beam. In the complainants' device the curved brace-bar is welded to the rear of the shank about midway between the point where the shank is pivoted to the beam and the tooth, and passes into the mortise at the end of the beam, where it may be clamped. As before stated, the tooth and shank of defendants' device consist of a single piece of metal; the head of the shank where it passes into the mortise at the end of the beam, being curved, and resting on the clamping bolt at proper distance from the point where it is pivoted to the beam. Is the curved form of the head of the shank the equivalent of complainants' brace-bar in the sense of the authorities cited? It was required that the word "brace," as used in complainants' specifications, has reference to the functions of an arm, or an enlargement of the upper portion of the shank of the shovel, and that the curved head of the standard or shank in the defendants' device, lying within the mortise, operates as an arm, and secures the same leverage or frictional power as does the complainants' brace-bar. Whether this feature of the complainants' combination be called a brace or an arm, there can be no question of the function it is intended to perform. It is not only to be clamped in the slot in the beam so as to hold the tooth securely in working position, but it is evidently intended to strengthen the shank below the beam so as to prevent it from bending or breaking when in operation, which is one of the primary functions of a brace. The complainant John S. Rowell testifies that the brace thus welded to the shank between the tooth

and the beam stiffens the shank, and allows the use of a lighter material for the shank than could otherwise be used. It operates as support, which it would seem removes the terminal strain from a point immediately below the beam to a point midway or below the center of the shank. This function of the brace is not found in the construction of defendants' machine, for it is evident that, as it is constructed, the strain terminates on the shank at the point where the shank is clamped. So that while it may be said that frictional resistance or leverage between the pivoted point and the clamping bolt is obtained in both devices, it is observable that the complainants' brace performs a function that is omitted in the defendants' machine. It affords support to the shank, strength to the structure, and the suitable term, "brace-bar," is used in complainants' specifications as expressive of power of resistance. And it is, therefore, not difficult to understand, as some of the witnesses have testified, why the complainants' device is recognized by the public as the "brace-tooth," and as capable of greater resistance, and less liable to bend or break than the defendants' machine.

Then, I think, there is force in the claim that the curved part of the shank lying within the beam in defendants' device performs a function not found in complainants' combination. The curved head rests on the clamping bolt, so that thereby all the teeth may be adujsted to a line. The function of alignment is thus secured, and by this arrangement of the parts, the bolt on which the head of the shank rests becomes not only a clamping device, but an aligning bolt. Furthermore, it is quite apparent, from an examination of the models, that in the operation of the defendants' machine, when, for example, the team is backed, the pressure does not move the teeth out of position, because the clamping bolt on which the curved head of the shank rests operates as a stop and prevents any forward movement of the teeth; whereas, in complainants' device, it is evident that if the brace is not set so tightly in the mortise that it cannot escape, it might, in backing, be drawn entirely out, and the teeth would be pressed forward, with nothing to operate as a stop except the pivot which fastens the shank to the beam, and with a liability that as

the machine should be started forward its movement might be such as to cause the brace to catch on the beam, or to prevent it from passing directly back within the slot or mortise. From what has been said, and without further elaboration, it would appear that the claim made by defendants is not without reason to support it, namely, that in their device they omit the brace-bar and do not substitute for it an element which wholly performs the same function; that, therefore, their substituted element, if there is one, is not an equivalent, because, "by an equivalent in such a case it is meant that the ingredient substituted for the one withdrawn performs the same function as the other." *Gill vs. Wells, supra.* Further, that in the construction of their device a new element is introduced which performs a function substantially different from that which the complainants' device was designed to perform (see *Babcock vs. Judd*, 1 Fed. Rep., 408); and in short, that the defendants' combination is a new arrangement of parts so different from complainants' as not to be the equivalent within the principles applicable to combination patents.

There is considerable similarity, at least in the application of principles, between this case and the case of *Prouty vs. Ruggles, supra.* Adopting the language of the court in that case, it may be well said here: "None of the parts referred to are new, and none are claimed as new; nor is any portion of the combination less than the whole, claimed as new, or stated to produce any given result. The end in view is proposed to be accomplished by the union of all arranged and combined together, in the manner described. And this combination, composed of all the parts mentioned in the specifications, and arranged with referrence to each other * * * in the manner therein described, is stated to be the improvement, and is the thing patented. The use of any two of these parts only, or of two combined with a third, which is substantially different in form or in the manner of its arrangement and connection with the others, is therefore not the thing patented. It is not the same combination if it substantially differs from it in any of its parts."

Certain models were prepared and submitted by one of the

expert witnesses, as illustrating the supposed identity of the two devices in question, but I do not think they demonstrate such identity. The structural arrangement of the parts in the two machines is substantially different. The brace-bar is a distinct member of the complainants' combination. They have claimed it in their specifications to be an essential part of their invention. It is the construction of the several parts, not separately, but in combination, which they claim to be new, and their improvement consists in arranging different parts of the cultivator, and combining them together in the manner stated in the specifications, for the purpose of producing a certain effect. *Prouty vs. Ruggles, supra.* Applying to the case what I conceive to be correct legal principles, my conclusion is, that the defendants do not infringe the complainants' patent.

Let the bill be dismissed.

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SUPREME COURT OF THE UNITED STATES.

October Term, 1884.

No. 132.

J. S. & I. ROWELL, Appellants,
vs.
E. J. & W. LINDSAY.

Appealed from the Circuit Court of the United States, for the Eastern District of Wisconsin.

BRIEF FOR APPELLEES.

By WOOD & BOYD,
Counsel for Appellees.

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INDEX.

PAGE.

History of case 1

Construction of claim—

I. Limited to the precise combination 2

II. The brace bar specified in the claim, means a strengthening bar united to the shank between the tooth and beam, ... 3

III. The claim can not be construed broadly to cover a wooden clamping beam for holding any form of tooth, ... 4

IV. Plaintiffs have for years acquiesced in the use of defendants' device 6

V. Practically, an iron clamp is the same as a wooden clamp, 7

State of the art, ... 7-9

I. Want of invention—Exhibit "Bevel Square" anticipates a wooden clamping beam, ... 9

II. Exhibit Dividers practically anticipates plaintiffs' patent, 10

III. The Atwood patent anticipates Rowell's patent, ... 11

IV. Atwood patent limits Rowell claim to the precise device as combined, ... 12

Infringement—

I. Defendants do not infringe, because their device does not contain the brace bar *C* of the patent, ... 13

II. Defendants do not use the equivalent of the brace bar *C*, but use a new device which operates to perform new and useful results, ... 13

III. The brace bar of Rowell's must support the shanks between the tooth and beam, ... 15

IV. Defendants' clamp is more durable than that of the patent, ... 16

Conclusion, ... 17

Judge Dyer's Opinion 19

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BRIEF FOR APPELLEES.

This suit is brought for the alleged infringement of re-issued Letters Patent, No. 2,909, dated March 31, 1868, which are for the alleged improvement in slip teeth for cultivators.

The defenses are :

First.—Non-Infringement.

Second.—Want of Novelty.

Third.—No Invention.

The case was tried in the court below, before Judge Dyer, who, after careful and elaborate opinion, dismissed the bill. The suit was brought here by the complainants in the court below.

The opinion of Judge Dyer is reported in 10 Bissell, 19 Off., Gaz. 1565, and 6 Federal Rep. 290.

We are not advised as to what portions of the findings expressed in the opinion of the learned judge will be complained of as error by the appellants, but presume that the plaintiffs stand upon the same propositions as they did in the court below.

These positions are carefully reviewed by Judge Dyer, in the opinion above cited. We will, therefore, present the same points as presented by us in the court below, in the brief here submitted.

POINTS.

I.

CONSTRUCTION OF CLAIM.

The claim is limited to a curved brace bar welded to the shank of the tooth, midway between the tooth and beam; the upper end of which brace passes through a slot or mortice in the beam, and the tooth held in position by a pivot in the shank of the tooth, and a clamping bolt in front of the brace bar.

The claim reads as follows:

"The combination of the slotted beam *A*, shank *B*, brace bar *C*, and bolt *D*, where the parts are constructed and arranged to operate, as and for the purposes herein specified."

The claim does not recite the pivot bolt *b*, described in the specification, and shown in the drawing as an element of the claim, but it is manifest that it is a necessary element to constitute a working device, and as the claim contains the clause, "when the parts are constructed and arranged to operate, as and for the purposes herein specified," a fair construction of the claim to harmonize with the description of the specification, necessarily would, by implication, include this pivot bolt *b*.

The specification describes the construction of the device as follows: "*A* represents one of the beams of the cultivator; *B*, the shank pivoted at *b*; *B'*, the tooth; *C*, a curved brace bar, extending in the arc of a circle outward and upward, from the rear side of the shank *B*, and its upper end passing vertically through a longitudinal slot or mortise *a* in the beam *A*; and *D*, a bolt passing transversely through the slot or mortise, and having a head *d*, on one end, and a nut *d'*, on the other end, by which the slide walls of the slot or mortice can be clamped

against the brace bar, with any required force, thereby holding the latter in position when operating in the field."

The specification further says, that the tooth will yield when coming in contact with obstacles, the shank turning back upon its pivot, the brace bar being forced up through the slot. "The same arrangement also allows the shank to be adjusted in any position for deep or shallow cultivating."

It then adds that "the device above described may be cheaply applied, is of very simple construction, and has been found more effective, practically, than other devices designed to operate in a similar way."

The device used by the defendants is destitute entirely of this brace bar, and the plaintiffs' counsel, to sustain their case, insist that the claim shall be construed to cover a wooden slotted beam, which clamps and holds a tooth of any construction.

Plaintiffs' experts also claim that the brace shown and described does not mean a strenghtening brace supporting the shank of the tooth.

II.

The brace bar C, specified in the claim, means a strengthening bar united to the shank between the beam and tooth to strengthen and support it.

We think this limitation to the claim is enforced, first by the very terms of the language used. The term "brace bar" conveys to ordinary minds the use of a rigid instrument to strengthen and support. A brace affords strength to the structure, but the use of the term "brace bar" makes it emphatic that an angular brace attached to the shank to stiffen it is required.

The language of the patent in defining the invention admits of no other understanding. It says, "this invention consists in applying to the shank of the tooth a curved *brace bar*."

One of the plaintiffs, John S. Rowell, testifies that the brace thus welded to the shank between the tooth and the beam,

stiffens the shank, and allows the use of a lighter material for the shank than could otherwise be used. He says (p. 22, folio 30): *Q.* "State how you came to manufacture your device in the form it is now? " "*A.* Well, I found this to be made of lighter iron. I could use a lighter iron by having a brace on the back; by welding a brace on I could use lighter material, and make it strong enough for common use."

Again, on p. 24: "*Q.* Of what use in your present device is that brace which is attached to the shank and runs backward?" "*A.* To get the distance from here to here, and at the same time to stiffen the shank to make a light shank, this brace allows us to use a lighter shank here by putting this on." "*Q.* It stiffens the shank to have the brace welded on between the tooth and beam does it?" "*A.* Yes, sir, it does, and allows us to use a lighter material for the shank than we would without it."

In corroboration of complainants we have the understanding of the public.

Mr. Goucher, a witness for the defendants (see p. 86), testified that it was the understanding of the dealers and manufacturers, that the Rowell brace was to strengthen the shank of the cultivator tooth, and he introduced several exhibits which will be explained hereafter, describing and illustrating what they understood to be a brace tooth, and a tooth without a brace. The opinion of Judge Dyer reviewing this question of construction of the patent is very clear, and we refer to it as a correct statement of the law and facts of this case.

III.

COMPLAINANTS' CLAIM CAN NOT BE CONSTRUED BROADLY TO COVER A WOODEN CLAMPING BEAM IN COMBINATION WITH ANY FORM OF CULTIVATOR TOOTH.

This seems to us to be conclusively settled by the patent itself, as is stated by Judge Dyer, whose opinion we quote: "The complainants do not in their specification or claim allege that

they are the inventors of a slotted beam, nor of anything less than the entire combination. And it is conclusively settled that where a patentee claims as his invention only the combination which he describes, the separate parts which constitute the combination are to be regarded as old or common and public." (The Corn Planter Pat. 23 Wall., 224.)

The same rule is stated in Miller *vs.* Brass Co., 104 U. S., p. 352: "But it must be remembered that the claim of a specific device or combination, and an omission to claim other devices or combinations, apparent on the face of the patent, are in law a dedication to the public of that which is not claimed. It is a declaration that that which is not claimed is either not the patentee's invention, or if it is his, he dedicates it to the public."

The testimony taken on behalf of the complainant enters largely into the question of the superiority of the wooden clamp over metallic ones, and the position taken by the complainants' expert witnesses is that a metallic clamp would not be practical for holding cultivator teeth. But all this is outside of the patent, which is the inventor's own declaration of what his invention consists. Not a single word or syllable is said in it about the character of the clamp. The force and construction of the specification is directed to the curved brace bar welded to the shank of the tooth, and passing endwise through the slot in the beam. The construction asked by complainants for this claim, in effect urges that the court import into the claim a feature not specified or hinted at in the text of the specification. This feature was evidently not in the mind of Mr. Rowell when he made his application for his patent. The original patent was dated July 3, 1867. It was re-issued in March, 1868. And this suit was not filed until March, 1878.

Mr. Rowell, one of the plaintiffs, admits that no complaint was ever made by him of infringement up to the time the suit was brought (*Rec. p.* 25). It moreover appears that P. P. Mast & Co., the Gorham M'f'g Co., and the De Pere M'f'g Co., have for a period of years prior to the bringing of this suit been

manufacturing and selling without objection on the part of complainants, unbraced cultivator teeth held in position by a wooden clamping bar.

Surely if the complainants had thought that they were entitled to the construction of claim now urged by counsel, they would have not only placed in their specification language justifying such a construction, but it would not have taken them twelve years to learn that their invention was different from the natural reading of the claim.

It is also in the testimony that the device sold by Lindsay, was manufactured and put on sale as early as 1872, by Thomas, Ludlow and Rodgers, of Springfield, Ohio.

It further appears that the latter party is the real defendant, and has paid the expenses of the defenses in this suit.

IV.

Plaintiffs stood by for years and saw defendants' device used without objection. He has by his conduct induced the public to believe that his claim is properly limited to the curved brace bar specifically described in his patent.

This court, in the case of Merrill *vs.* Yomans (94 U. S. 573), states the equity belonging to the defendants and the public in regard to the construction of the claim, in apt and forcible language.

"The public should not be deprived of rights supposed to belong to it without being clearly told what it is that limits those rights. The genius of the inventor constantly making improvements in existing patents, a process which gives to the patent system its greatest value, should not be restrained by vague and indefinite descriptions of claims in existing patents, from the salutary and necessary right of improving on that which has already been invented. It seems to us that nothing can be more just and fair, both to the patentee and to the public, than that the former should understand and correctly describe just what he has invented, and for what he claims a patent.

Vance v. Campbell - 1 Black pp. 429-430
Water Meter Co. v. Desper - 101 U.S. 337
Page v. Herring - 107 U.S. 648

V.

PRACTICALLY AN IRON CLAMP IS JUST AS GOOD AS A WOODEN CLAMP.

The wooden clamping beam is undoubtedly the cheapest, and that is the sum of the differences. This is proven by the testimony of A. R. Ludlow (p. 185, Ans. 30), by J. S. Bogle (p. 161, Ans. 42), and in the testimony of Mr. Powers (p. 113, Ans. 21), and we have stronger proof than the testimony of these witnesses.

The Hoosier drill drag-bar, the Gorham drag-bar, the De Pere and the Esterly drag-bar, all employ metallic clamps for holding their teeth in position.

These teeth have been manufactured largely, and sold in the market, and practically prove that the character of the material of which the clamp is made is not essential in practice. (See testimony of M. C. Goucher, pp. 86-7.) Metallic and wooden clamps are both old and well known, and it seems to us, as it must have seemed to the party who drew Mr. Rowell's specification, that there is no invention in the substitution of one material for another to act as a clamping device.

STATE OF THE ART--EBERLY PATENT.

Slip teeth for cultivators are very old. One of the earliest patents is that of D. Eberly, shown on pages 214-215 of the record. This differs in form from the Rowell slip tooth, but it performs the same functions.

The shank is braced between the beam and the point of the cultivator tooth. A clamp is employed to allow the tooth to yield when it strikes obstructions and pass over them without injury to the tooth. It is a substantial anticipation of any broad claim that Rowell could have made.

HARVERSTICKE PATENT.

Another form of slip tooth is shown in the patent to L. Harversticke, 1860, pp. 216-218 of the record. The inventor

says: "My invention consists in attaching the seed tube or shank of each share to its respective share beam by a hinge, a shank being also connected with the share beam by an adjustable spring coupling sufficiently rigid to hold it with its share in the proper position for forming a furrow in the earth, but which, when the share strikes an obstacle that would otherwise break the machine being detached by the strain from the shank, allows the latter to turn backward and pass over the obstacle."

This device accomplishes all the general results claimed for the Rowell invention.

ROWELL AND LOWTH PATENT.

Jno. S. Rowell, one of the plaintiffs, and M. F. Lowth, in 1862, obtained a patent upon another form of slip tooth, which was re-issued April 13, 1869.

This patent shows another form of braced slip tooth, but the brace is forward of the shank of the tooth, as in the Eberly patent.

Mr. J. S. Rowell testifies, on page 25, that the objection to this first form of tooth was, that it would let go when pulled back. They wanted one that would not let go when pulled back, or, as afterward stated, one that had a continuous clamp.

It will be observed that Mr. Rowell makes no claim that the metallic character of that clamp was deficient, but what he wanted was a continuous clamp. This continuous clamp is found in the Eberly device.

FRANCISCO PATENT.

Francisco obtained a patent March 7, 1865, for the braced looped form of tooth having a cam shape, and a spring brake, which accomplish practically all the objects of the Rowell invention, but it was made of different shape, so that it could be fastened up out of the way, folded either forward or backward, as shown in Figs. 3 and 4 of the patent.

FOWLER AND BACON PATENT.

This patent shows a metallic frictional clamp, operating in a different form from that of the Rowell, but accomplishing the same general results.

THE WOODEN CLAMP IS AN OLD AND WELL-KNOWN DEVICE.

On page 111 of the record, Mr. Powers, defendants' expert, testifies as follows:

"I have known of such devices as are enumerated in the question, ever since I can remember as a mechanic, and one of the most frequently seen is found in what is known, in mechanical parlance, as a beveled square, one of which I here produce. It will be seen that the body of this square is composed of a piece of wood, slotted part way from one end, and into which slot is inserted a bolt, having a slotted mortise in one end of it, and through which and through the two sides of the slotted wood is passed a clamping bolt, with a screw nut on one end, making a device that admits of clamping the slotted metallic blade in any desired position, the object being to set the blade to describe different angles in mechanism, and used for forming angles or cutting joints, and for various purposes. * * * I have known them in use for at least fifty years, and my observation is that all carpenters and joiners, cabinet-makers, and similar mechanics, have them among their kits of tools as commonly as they have a saw or a carpenter's square."

I.

WANT OF INVENTION.

An examination of the Francisco patent will show that the inventor was after additional objects from that shown in the earlier patents of Eberly, Rowell and Lowth, and the later patents of complainants in question.

If we take the Francisco patented device and omit the peculi-

ar spring catch *D*, and substitute therefor the clamping bolt shown in the old and well known beveled square, we would have substantially the Rowell tooth, except that it would be better, as it would obviate the objection existing in the Rowell tooth, of its coming out of the beam when the machine is backed, or subject to back pressure. And this we submit would not involve invention, because it would be the substitution of an old and well-known clamping device for the peculiar clamping device shown in the Francisco patent. (See testimony of D. J. Powers, pp. 112-113 of the record.)

II.

EXHIBIT DIVIDERS.

Again, take the common carpenter's dividers, which employ the quadrant shaped brace, and a set screw for the clamp, to hold the brace in any fixed position. The employment of such a brace and clamp on any form of brace slip tooth, in lieu of the older devices shown, would not involve invention, and practically accomplish all that Rowell accomplished in the same way by well-known mechanical means. (See testimony of D. J. Powers, pp. 112-113.)

That these facts warrant the defense of no invention, we urge with confidence, in view of the many cases decided in this court. The case of Dunbar *vs.* Myers, 94 U. S., 187, contains a review of many of the leading cases holding a patent void for want of invention, to which we refer as authority on this point. In the case of Smith *vs.* Nichols, 21 Wall., 115, the court say: "Meritorious inventions are entitled to protection, but it is settled law that the mere carrying forward of an original patented conception, involving only change of form, proportion, or degree, or the substitution of equivalents doing the same thing, that the original invention, of substantially the same means, is not such an invention as will sustain a patent even though the changes of the kind may produce better results."

We therefore insist that in view of the state of the art, complainants' patent does not involve invention.

III.

ANTICIPATION—ATWOOD PATENT.

A patent was granted to Carroll Atwood, April 24, 1866. It is earlier than complainants' original patent, which was dated July 3, 1866. The application of the Atwood patent was sworn to, on the 4th day of Dec. 1865, and filed in the office, Jan. 19, 1866. (See pp. 230–231 of record.)

This patent is a practical anticipation of the Rowell device, the only difference being it has a metallic set screw clamp, and the rear brace is pivoted to the shank between the mold-board and chair, instead of being welded to it between the share and beam. Mr. Atwood testifies that these were made in the winter of 1864-5. The first on plows were used in the spring of 1865. The object of the construction of this form of plow, as stated by Mr. Atwood (pp. 207 and 208), was that in case the plow strikes obstructions, the brace will slip up, and the plow back, without breaking; and the depth of the running of the plow was regulated by the position in which the brace was set.

The complainants have attempted to ante date the invention of Mr. Atwood, and for this purpose called J. S. Rowell, one of the complainants, who swore in substance that his invention was put into practical use as early as February or March, 1865. (See rec. p. 50.) But the witness swears from general recollection, and he swears to have no means of fixing the time, except that the first machine was delivered to his brother, who took it home on a sleigh.

Mr. Atwood's first invention was put in use early in 1865. As he lives in southern Illinois, where plowing commences often in January, it must have been very early in that year, so that the question of which was first in point of invention, between Atwood and Rowell, is uncertain.

The burden of proof in the first instance is on the defendant to prove the earlier invention. This is done by us on documentary proof, the dates of which can not be questioned. We hold that now the burden of proof is shifted, and that if the complainant would carry back his invention, he must do so by

proving it beyond a reasonable doubt, which complainants have certainly failed to do.

IV.

ATWOOD PATENT LIMITS THE CONSTRUCTION OF THE ROWELL CLAIM TO THE PARTICULAR DEVICE SHOWN AND DESCRIBED.

In the present case, perhaps, it will be unnecessary to discuss the last point, as complainants' patent was taken out subsequently to the Atwood patent, with its claim limited to the particular combinations of elements shown in the Rowells patent. The existence of the prior Atwood patent explains why the Rowells were content to take their limited claim. They acquiesced in the fact of the Atwood invention being prior, and took their claim and notified the world in fact that they would be limited to their curved brace bar welded to the shank in the particular manner which they show and describe. By this limitation they are bound. The law, as this court has frequently decided, requires the patentee to make his claims in language so clear and specific, that the public may know exactly the meets and bounds of his invention, and estops the complainants from claiming a construction broader or different from the natural and fair meaning of the terms employed. It was incumbent upon the Rowells, if they intended to make a claim upon the wooden clamping bar with a braced cultivator tooth, to have described their invention and made their claims so explicit that the world would have understood the character and scope of such claim. It was also incumbent upon the Rowells to have gone into interference with Mr. Atwood, and had the priority of invention decided, and the claims made commensurate with it if they are to cover the invention, as they now describe and claim it. The Atwood invention is substantially like the Rowells', and the Rowell claim can only be held valid when limited to the precise form and arrangement of the parts.

Patent law suits are expensive luxuries, and in the case at bar,

forms of slip teeth were so old that various different ones could be used with equal effect (as shown by the testimony of defendants' experts), as the peculiar clamping bar shown in the Rowell patent.

We have introduced two illustrative models, modifications of the Eberly devices, which show other devices which the defendants could readily have adopted to accomplish precisely the same things that Rowell accomplished without infringing his patent, had the Rowells made the claim of their patent in terms harmonizing with the scope now urged by their counsel. Those or other forms of device it is reasonable to suppose would have been adopted and used by the defendants rather than be involved in the expense of this extended litigation. Now, had the Rowells themselves supposed that they were entitled to the claims now urged in their behalf by counsel, it is reasonable to suppose they would not have stood by for six years and allowed Thomas, Ludlow & Rogers to have manufactured and sold this device, before bringing suit. All these considerations, it seems to us, require a very limited construction to be placed upon the claims at bar, which will accord with the action of the complainants and defendants, and the common understanding of the public.

INFRINGEMENT.

I. Defendants do not infringe because their device does not contain the brace bar *C* of the patent. Construed as the claim must be, in view of the state of the art, we think this proposition is self evident, and we refer your Honors to the decision of Judge Dyer upon this point, for a clear, logical, concise statement of the law and equity of the case at bar.

II. *Defendants do not employ an equivalent of complainants' brace bar C.*

The complainants realize the difficulties of sustaining an infringement, and have undertaken to prove that the upper curved portion of the shank clamped between the jaws of the beam is an equivalent for the brace bar of the Rowell patent.

An equivalent in a combination claim has frequently been defined in this court, and what is not equivalent in a combination has been so often defined, that now we have no difficulty in distinguishing between equivalents and non-equivalents.

Complainants insist that the curved portion of the shank of defendants' tooth, clamped between the jaws of the beam, is a brace, because it affords leverage or resistance to the movement of the tooth.

This is a perversion of the term *brace*; instead of affording leverage, it affords resistance, or rather a decreasing of the leverage: and instead of stiffening the shank, it increases the strain brought upon the shank.

It will be observed that defendants' form of shank, and the arrangement of the clamping bolt, is for the purpose of performing substantially new and different functions from what Rowell had invented or described.

This arrangement of the defendants' device accomplishes two new and useful results: first, the bent upper end of the shank is made in connection with the clamping bolt, to serve as a stop against the forward movement of the bolt. Defendant also aligns his teeth by means of this stop. The shank of the tooth is placed so as to rest against the clamping bolt. This brings the teeth all in a line, and it is very convenient in use. The testimony shows that when in use in the field, if the tooth is moved out of place by an obstruction, the operator with his foot kicks it forward until it strikes the bolt, so that it is readily aligned or brought back into position. (See testimony of Mr. Ludlow, p. 183, Ans. 19, and Boyle, p. 160, Ans. 35.)

Another important advantage in defendants' device is, it prevents the tooth from being carried out of position when the team is stopped quickly, as the backward rebound is resisted by the stop or clamping bolt. Whereas, in the Rowell device, the curved brace bar is liable to be forced out of the slot in the beam. It then requires a loosening of the bolt to set it again in position. (See testimony of Mr. Ludlow, p. 182, Ans. 15.)

Defendants, therefore, have not employed a well known substitute for the Rowell brace bar *C*, but have employed a peculiar shape of shank and position of clamping bolt, gripped between the jaws of the beam, so that the teeth may be readily aligned against the bolt, which prevent it from being carried out by back thrusts. This difference is substantial and material. Defendants, therefore, do not employ an equivalent for the curved brace bar of the Rowell patent, but employ a device which is distinguishable therefrom, and not an equivalent, as stated in the case of Gould *vs.* Rees (15 Wall., 187). "But the rule is otherwise, if the ingredient substituted was a new one, or performed a substantially different function, or was not known at the date of the plaintiffs' patent as a proper substitute for the one omitted from his patented combination. Where the defendant in constructing his machine omits entirely one of the ingredients of the plaintiffs' combination, without substituting another, he does not infringe; but if he substitutes another in the place of the one omitted, which is new, or which performs a substantially different function, or if it was old but not known at the date of plaintiffs' patent as a proper substitute for the omitted ingredient, then he does not infringe."

And the same rule is stated in almost precisely the same language in Gill *vs.* Wells (22 Wall., 1). There is no testimony in the case tending to prove that this form of shank and position of clamping bolt employed by the defendants was old, but on the contrary, it is shown to be new and patented by the manufacturers. (See patent to J. H. & J. W. Thomas, January 13 1874.)

III. *A material element of the combination of the Rowell claim is the curved brace bar, which supports and strengthens the shank between the tooth and cultivator beam.*

Mr. J. S. Rowell has testified, as before quoted, that his brace bar strengthens and supports the shank.

Mr. Goucher testifies that the defendants' tooth is one which

is known and understood by the trade to be one without a brace; that the brace tooth is a well-known article to the trade, and he enumerates the following exhibits as known to the trade as having no brace, to-wit:—The De Pere, the Appleton, the P. P. Mast, the Hoosier, the Gorham, and the Thomas, Ludlow & Rogers, or the defendants' brace.

The Rowell is classed and known as the brace tooth. He testifies that there are more machines made and sold without a brace than with a brace. He further testifies that the defendants' tooth bent in the shank, and he received frequent complaints of this, and his customers, some of them, wanted a braced tooth (see Record, pp. 86-87.) This testimony is not disputed by any of complainants' witnesses, and it is corroborated in substance by Mr. Ludlow, Mr. Bogle, and Mr. Powers. This understanding of the public is the natural one, and the one on which the public and those defendants acted for years, and the complainants stood by and saw this class of no brace teeth manufactured without objection. We understand that it is highly persuasive, if not conclusive, that the complainants themselves supposed their claim was limited to the peculiar curved brace bar shown in their patent. Sufficient to justify a court of equity from denying a different construction of their claim, which would include that which they and the public for years acquiesced and believed to be the reasonable and proper construction.

IV. *Defendants' form of clamp is more durable than that of complainants'.*

One of the defendants, E. J. Lindsay, testifies (pp. 98 and 99 of Record) that the Rowell clamp wore out. Mr. Goucher (p. 88) states the reason why the clamp of the Rowell wore out much more quickly than that of defendants'. The brace bar slides endwise between the jaws of the wooden beam, and so wears: while the defendants' peculiar shaped shank moves laterally through the mortise, and has a great deal more frictional surface employed to hold the tooth, and a less amount of wear. Besides, the Rowell tooth wears a crease in the mortise; where-

as, in the defendants' device, the entire sides of the mortise are worn away uniformly, and hence make a better form of clamp.

CONCLUSION.

In summing up this branch of the case, his Honor, Judge Dyer, held that defendants did not infringe, because in "their device they omit the brace bar, and do not substitute for it an element which performs the same function, and therefore their substituted element, if there is one, is not the equivalent; because, by an equivalent in such a case is meant that the ingredient substituted for the one withdrawn, performs the same function as the other. (Gill *vs.* Wells, *supra.*) Further, that in the construction of their device, a new element is introduced which performs a function substantially different from that which the complainants' device is designed to perform. And, in short, that the defendants' combination is a new arrangement of parts, so different from the complainants' as not to be the equivalent within the principles applicable to combination patents."

This case is not unlike the case of Prouty *vs.* Ruggles (16 Pet., 336).

The patent in question, in that case, was for a plow, where the standard was constructed by jogging into the beam, so as to serve for brace and draft, the infringing device did not jog into the beam.

The court held, that unless both functions should be performed, to-wit: the brace and draft, the claim was not infringed. In the case at bar, the peculiar form of the Rowell brace was to serve for both brace and draft.

In defendants' device there is nothing to brace or strengthen the shank. The form of the shank is made to serve for draft alone. It does not infringe, therefore, the combination specified in the claim of complainants' patent.

We have printed as an addenda to our brief, the decision of

his Honor, Judge Dyer. We submit that the conclusions of his Honor are sound, and will meet the approval of this court.

Respectfully submitted,

WOOD & BOYD.

UNITED STATES CIRCUIT COURT, EASTERN DISTRICT OF WISCONSIN.

JOHN S. ROWELL and IRA ROWELL,
vs.
EDMUND J. LINDSAY and WILLIAM LINDSAY,
} *In Equity.*

OPINION OF THE COURT.

DYER, J. This is a bill to restrain the infringement of a patent for an alleged new and useful improvement in cultivators. The original patent was issued to complainants July 3, 1866. A re-issue was granted March 31, 1868.

Various defenses are interposed, among which is the defense that the defendants are selling cultivators made by Thomas, Ludlow and Rogers, of Springfield, Ohio, which are covered by Letters Patent No. 152, 706, granted to J. H. & J. W. Thomas, June 30, 1874, and they deny that they are infringing complainants' patent.

In the specifications of the patent, the invention is described as consisting of the application to the shank (*B*) of the tooth, of a curved brace bar (*C*), the upper end of which passes through a slot or mortise in the beam (*A*), and is held in position by a clamping bolt (*D*) which passes transversely through the slot or mortise near the brace bar, so as to clamp it in any required position, and thereby adjust the tooth in any inclination, at the same time allowing it to yield to immovable obstacles without breaking.

It is further stated in the specifications, that "it is evident that, in a device thus constructed and operating, the brace bar *C* can be so clamped that the tooth will retain its position when working in arable soil, but will yield when coming in contact with an immovable obstacle, and pass over it without breaking, the shank turning back upon its pivot, and the brace bar being forced up through the slot."

The invention being thus described, what is claimed as new and desired to be secured by letters patent, is the "combination of the slotted beam *A*, shank *B*, brace bar *C*, and bolt *D*, when the parts are constructed and arranged to operate as and for the purposes herein specified."

The device patented to J. H. & J. W. Thomas, and which the defendants are selling, consists of a wooden bar or beam having a slit in the rear end to receive the shank of the shovel or tooth.

The shank and the tooth consist of one piece of metal, the shank at its upper end being of curved form, and secured in the slit by a bolt or pivot.

Another threaded bolt is passed through the beam or drag-bar a little in the rear of the bolt, to which the shank of the tooth is fastened, and in such place as to sustain the tooth or shovel when in proper position. It is stated in the specifications of the patent that the ends of the bifurcated bar or beam are drawn down by the threaded bolt which sustains the tooth or shovel when it is in position, or by the united action of both the bolts mentioned, "until clamped against the standard of the shovel, with such force that the friction shall maintain the shovel in position while passing through mellow earth, but not so tight but that it will yield to an excessive resistance before force enough is applied to break the shovel."

It is further stated, that by making the shank in one piece, its construction "is greatly cheapened as compared with that class where an arm has to be welded to the shank;" and the substance of the patentee's claim is, in combination with the drag bar or beam, bifurcated at the rear end, the shovel standard curved at its head, and where it is adjusted to the drag-bar, and pivoted and clamped by the bolts before described.

The only question which it is necessary to consider, is that of infringement. The complainants' patent is for a combination. It is a settled rule of law that where a patent is for a combination of known parts, it is not infringed by the use of any num-

ber of the parts less than the whole; for the patent in every such case is for that identical combination, and nothing else, and a combination of any less number of parts is a different thing. Sharp *vs.* Tifft, 2 Fed. Rep., 697. This principle has been so often reiterated that it is elementary. Prouty *vs.* Ruggles, 16 Pet., 336; Lee *vs.* Blandy, 2 Fish., 89; Latta *vs.* Shawk, 1 Fish., 465; Gould *vs.* Rees, 15 Wall., 187. There is, however, another class of combinations where some of the parts are new and others old, and where the new parts are claimed as inventions; if the combination is of this character, the appropriation of the part which is new is an infringement. Latta *vs.* Shawk, *supra*; Lee *vs.* Blandy, *supra*; Sharp *vs.* Tifft, *supra*. The complainants claim that their patent falls within the latter class. They insist that the slotted wooden beam used for the purposes designated in their combination, is a new invention, in and of itself, and that as the defendants use such a beam, they infringe. It may be, and in fact the testimony tends to establish, that a slotted wooden beam was not used before complainants' patent for holding cultivator teeth. But this is not enough to make it a new thing within the rule last above stated. As matter of fact, a beam containing a slot or mortise, such as that in the complainants' device, is old, and the most that can be rightfully claimed in that respect, is that an old and well-known part or thing is applied to a new use, as part of a patented combination. Furthermore, the complainants do not, in their specification or claim, allege that they are the inventors of the slotted beam, nor of anything less than the entire combination. And it is conclusively settled, that where a patentee claims as his invention, only the combination which he describes, the separate parts which constitute the combination are to be regarded as old or common and public.

In Rich *vs.* Close, 4 Fish., 282, it was said by Judge Woodruff, that "an inventor must be taken to know of what his invention consists, and his patent does not secure to him the exclusive right in anything more than he claims to have invented.

* * * * Here, the patentee has narrowed his claim by the use of terms which are express and clear. What I claim as my invention, and desire to secure by letters patent, is the combination of the wheel constructed as hereinbefore described, with the spiral conductor *D*, and tube *F*, so as to get the full pressure of the water, while the wheel is relieved of its weight, in the manner and for the purpose set forth. He does not claim to have invented either of these parts separately, nor to have invented a useful combination of any two of the parts without the third. He may have invented each of them, but he has not obtained a patent for either of them. We are, therefore, left to the assumption that each was old, and that his specific combination alone was new."

In the Corn Planter Patent, 23 Wall., 224, it was held that "where a patentee, after describing a machine, claims as his invention a certain combination of elements, or a certain device or part of the machine, this is an implied declaration as conclusive, so far as that patent is concerned, as if it were expressed, that the specific combination or thing claimed is the only part which the patentee regards as new. True, he or some other person may have a distinct patent for the portions not covered by this; but that will speak for itself. *So far as the patent in question is concerned, the remaining parts are old or common and public.*"

These statements of the law, as thus expressed in the two cases cited, are exactly applicable to the case at bar. Here, as in Rich *vs.* Close, the patentees have narrowed their claim by the use of clear and express terms. "What we claim as new, and desire to secure by letters patent, is the combination of the slotted beam *A*, shank *B*, brace bar *C*, and bolt *D*. When the parts are constructed and arranged to operate as and for the purposes herein specified." Not having claimed to have invented either of the parts separately, and expressly claiming only a certain combination of parts as described, there is an implied declaration, as conclusive as if it were expressed, that

the specific combination is the only part which the patentees regard as new, and that the several parts of the combination are old.

Upon the highest authority it therefore conclusively appears, I think, that complainants are not in a position to claim that their slotted beam was of itself a new invention or discovery; and, as before stated, it is not enough to say, that it was not before used for holding cultivator teeth, for it can not be reasonably claimed that the mere application of an old thing to a new use in a combination, is such invention of a new part as would bring the case within that class of combination, where the appropriation of a single part is an infringement. But it is contended, that the slotted beam is the distinctive and essential feature of complainants' invention, and should be regarded as such in passing on the question of infringement. The court must however look at the entire specifications and claim of the patentees, in determining what their invention is. The combination is an entirety. Unless it is maintained as such, the whole of the invention fails. If one of the elements is given up, the thing claimed disappears. Where a patentee suing for an infringement, declares upon a combination of elements which he asserts constitute the novelty of his invention, he can not abandon a part of such combination and maintain his claim to the rest. Much less can he prove any part of his combination immaterial or useless. Vance *vs.* Campbell *et al.*, 1 Black 427. The different parts may perform more or less important functions, but each and all are essential to make the thing which the patentee has claimed as his invention.

It follows from what has been stated, that the defendants do not infringe the complainants' patent by merely using the slotted beam. They do not infringe unless they have appropriated the entire combination. The patentees declare in their specifications what their invention is. They expressly say, *inter alia*, that it consists "*in applying to the shank of the tooth a curved brace bar*, the upper end of which passes through a slot or mortise in

the beam." The defendants use the slotted beam, the shank of the tooth, and the clamping bolt. But in their device there is no brace bar welded to the shank and passing up through the mortise in the beam. Both parties use the pivot which attaches the shank to the beam, but this pivot is not claimed by the complainants as part of their invention. As, therefore, the construction of the defendants' device does not include the curved brace bar, if the case were to stop here, it would seem that the patentees' entire combination is not appropriated, and so there is no infringement.

But it is insisted that the difference between the two devices is one merely of form, and that in fact all the elements of the complainants' machine are present in that which the defendants are selling. There is no doubt of the right of a patentee to invoke the doctrine of equivalents on a question of infringement in the case of a combination patent. The law upon this subject is settled in Conover *vs.* Roach, 4 Fish., 12; Seymour *vs.* Osborne, 11 Wall., 516; and in Gould *vs.* Rees, 15 Wall., 187. In the case of Seymour *vs.* Osborne, the court say, that "mere formal alterations in a combination * * * * are no defense to the charge of infringement, and the withdrawal of one ingredient from the same, and the substitution of another which was well known at the date of the patent as a proper substitute for the one withdrawn, is a mere formal alteration of the combination if the ingredient substitued performs substantially the same function as the one withdrawn." But the court further say, that to constitute infringement, all the material ingredients of the prior combination must be appropriated, and that the inventors of a combination "can not suppress subsequent improvements which are substantially different, whether the new improvements consist in a new combination of the same ingredients, or of the substitution of some newly discovered ingredient, or of some old one performing some new function not known at the date of the letters patent as a proper substitute for the ingredient withdrawn." And in Gould *vs.* Rees, the

court say: "*Bona fide* inventors of a combination are as much entitled to equivalents as the inventors of other patentable improvements. * * * * Apply that rule, and it is clear that an alteration in a patented combination which merely substitutes another old ingredient for one of the ingredients in the patented combination, is an infringement of the patent if the substitute performs the same functions, and was well known at the date of the patent as a proper substitute for the omitted ingredient; but the rule is otherwise, if the ingredient substituted was a new one, or performs a substantially different function, or was not known at the date of the plaintiff's patent as a proper substitute for the one omitted from his patented combination. Where the defendant in constructing his machine omits entirely one of the ingredients of the plaintiff's combination, without substituting any other, he does not infringe, and if he substitutes another in the place of the one omitted, which is new, or which performs a substantially different function, or if it is old, but was not known at the date of the plaintiff's patent as a proper substitute for the omitted ingredient, then he does not infringe."

See also Gill *vs.* Wells, 22 Wall., 1.

It follows, therefore, from these statements of the law, that if the defendants omit entirely one of the elements of the complainants' combination, without substituting any other, or if they substitute another which is new, or which performs a substantially different function, or if it is one that is old, but was not known at the date of the complainants' patent as a proper substitute for the omitted ingredient, or if their machine consists in a new combination of the same ingredients, then the defendants do not infringe.

A material ingredient of complainants' device is the curved brace bar welded to the shank of the tooth. This can not be denied. If the defendants, omitting the brace bar, have substituted an element in its place, that substitution consists not in supplying by physical addition another part distinct from the

rest of the device, in the place of that omitted, but in merely changing the form of the head of the shank where it rests in the mortise in the beam. In the complainants' device, the curved brace bar is welded to the rear of the shank about midway between the point where the shank is pivoted to the beam and the tooth, and passes into the mortise at the end of the beam where it may be clamped. As before stated, the tooth and shank of the defendants' device consist of a single piece of metal, the head of the shank, where it passes into the mortise at the end of the beam, being curved and resting on the clamping bolt at proper distance from the point where it is pivoted to the beam. Is the curved form of the head of the shank the equivalent of complainants' brace bar, in the sense of the authorities cited? It was argued that the word brace as used in complainants' specification, has reference to the functions of an arm, or an enlargement of the upper portion of the shank of the shovel, and that the curved head of the standard or shank in the defendants' device, lying within the mortise, operates as an arm, and secures the same leverage or frictional power as does the complainants' brace bar. Whether this feature of complainants' combination be called a brace or an arm, there can be no question of the function it is intended to perform. It is not only to be clamped in the slot in the beam so as to hold the tooth securely in working position, but it is evidently intended to strengthen the shank below the beam so as to prevent it from bending or breaking when in operation, which is one of the primary functions of a brace. The complainant, John S. Rowell, testifies, that the brace thus welded to the shank, between the tooth and the beam, stiffens the shank and allows the use of a lighter material for the shank than could otherwise be used. It operates as a support which it would seem removes the terminal strain from a point immediately below the beam to a point below the center of the shank. This function of the brace is not found in the construction of defendants' machine, for it is evident that as it is con-

structed, the strain terminates on the shank at the point where the shank is clamped. So that, while it may be said that frictional resistance or leverage between the pivotal point and the clamping bolt is obtained in both devices, it is observable that the complainants' brace performs a function that is omitted in the defendants' machine. It affords support to the shank, strength to the structure, and the suitable term brace bar is used in complainants' specifications, as expressive of power of resistance. And it is therefore not difficult to understand, as some of the witnesses have testified, why the complainants' device is recognized by the public as the brace tooth, and as capable of greater resistance, and less liable to bend or break than the defendants' machine.

Then I think there is force in the claim, that the curved part of the shank lying within the beam in defendants' device, performs a function not found in complainants' combination. The curved head rests on the clamping bolt, so that thereby all the teeth may be adjusted to a line. The function of alignment is thus secured, and by this arrangement of the parts, the bolt on which the head of the shank rests becomes not only a clamping device but an aligning bolt. Furthermore, it is quite apparent from an examination of the models, that in the operation of the defendants' machine, when, for example, the team is backed, the pressure does not move the teeth out of position, because the clamping bolt, on which the curved head of the shank rests, operates as a stop and prevents any forward movement of the teeth; whereas, in complainants' device, it is evident that if the brace is not set so tightly in the mortise that it can not escape, it might in backing be drawn entirely out, and the teeth would be pressed forward with nothing to operate as a stop except the pivot which fastens the shank to the beam, and with a liability that as the machine should be started forward its movement might be such as to cause the brace to catch on the beam, or to prevent it from passing directly back within the slot or mortise.

From what has been said, and without further elaboration, it would appear that the claim made by defendants is not without reason to support it, namely, that in their device they omit the brace bar and do not substitute for it an element which wholly performs the same function; that therefore their substituted element, if there is one, is not an equivalent, because "by an equivalent in such a case, it is meant that the ingredient substituted for the one withdrawn, performs the same functions as the other." Gills *vs.* Wells, *supra.*

Further, that in the construction of their device a new element is introduced, which performs a function substantially different from that which the complainants' device was designed to perform (see Babcock *vs.* Judd, 1 Fed. Rep., 408), and, in short, that the defendants' combination is a new arrangement of parts, so different from the complainants' as not to be the equivalent within the principles applicable to combination patents.

There is considerable similarity, at least in the application of principles between this case and the case of Prouty *vs.* Ruggles, *supra.* Adopting the language of the court in that case, it may be well said here, "none of the parts referred to are new, and none are claimed as new; nor is any portion of the combination less than the whole claimed as new or stated to produce any given result. The end in view is proposed to be accomplished by the union of all arranged and combined together, in the manner described. And this combination, composed of all the parts mentioned in the specifications, and arranged with reference to each other, * * * in the manner therein described, is stated to be the improvement, and is the thing patented. The use of any two of these parts only, or of two combined with a third, which is substantially different in form, or in the manner of its arrangement and connection with the others, is therefore not the thing patented. It is not the same combination if it substantially differs from it in any of its parts."

Certain models were prepared and submitted by one of the

expert witnesses, as illustrating the supposed identity of the two devices in question, but I do not think they demonstrate such identity. The structural arrangement of the parts in the two machines is substantially different. The brace bar is a distinct member of the complainants' combination. They have claimed it in their specifications to be an essential part of their invention. It is the construction of the several parts, not separately, but in combination, which they claim to be new, and their improvement consists in arranging different parts of the cultivator, and combining them together in the manner stated in the specifications, for the purpose of producing a certain effect. Prouty *vs.* Ruggles, *supra*.

Applying to the case what I conceive to be correct legal principles, my conclusion is, that the defendants do not infringe the complainants' patent.

Let the bill be dismissed.